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IN THE

Supreme Court of the United States

OCTOBER TERM, 1972.

No. 72-1536

BRUNNER & LAY, INC.,

Petitioner,

vs.

INGERSOLL-RAND COMPANY,

Respondent.

PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FIFTH CIRCUIT.

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OCTOBER TERM, 1972.

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BRUNNER & LAY, INC.,

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INGERSOLL-RAND COMPANY,

Respondent.

PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FIFTH CIRCUIT.

Petitioner prays that a writ of certiorari be issued to review the judgment of the United States Court of Appeals for the Fifth Circuit entered on February 20, 1973.

OPINIONS BELOW.

The opinion of the Court of Appeals for the Fifth Circuit (p. A20 *infra*) is reported at 177 U. S. P. Q. 112. The Findings of Fact and Conclusions of Law of the District Court (p. A8 *infra*) are not reported. The District Court did not file an opinion.

JURISDICTION.

The judgment of the Court of Appeals for the Fifth Circuit was dated and entered February 20, 1973. A Petition for Rehearing was denied April 4, 1973. A stay of mandate until May 18, 1973 was granted April 18, 1973. The jursidiction of this Court is invoked under Title 28 U. S. Code, Section 1254(1).

QUESTIONS PRESENTED.

I. May the Court of Appeals merely ignore the findings of fact of the District Court and independently make its own findings of fact in conflict with the findings of the District Court which are not shown to be "clearly erroneous"?

II. In determining whether certain pertinent prior art was considered by the patent office examiner in issuing a patent, and thus determining the weight to be given to the presumption of validity of the patent in suit, may the Court of Appeals *assume* that the examiner had knowledge of that prior art when there is no evidence in the written record of the patent office that the examiner was indeed possessed of that knowledge and the written record discloses that the absence of what that prior art taught was the crux of the examiner's agreeing that patentable subject matter was present?

III. Should the fact that the defendant copied the patentee's product be regarded as persuasive evidence that the patent covering the product is valid or is the public policy best served by encouraging businesses to compete with product covered by apparently invalid patents?

IV. May a person be granted a patent monopoly on the end result of the use of a well-known manufacturing method employed to produce a known article of commerce by reason of the fact that the person was the first to produce that article using that method?

V. Does the cancellation of a claim, which claim was rejected by the patent office on prior art, estop the patentee from subsequently contending that the subject matter of that claim was patentable?

VI. Do the "rules of the game" permit an applicant for a patent to be less than candid with the patent office, or does such conduct create an "exceptional case" dictating the award of attorneys fees to a defendant in an infringement action in which the patent is held invalid?

STATUTES, FEDERAL RULES AND REGULATIONS INVOLVED.

35 USC 103:

"A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made."

35 USC 285:

"The court in exceptional cases may award reasonable attorney fees to the prevailing party."

RULE 52—FEDERAL RULES OF CIVIL PROCEDURE:

" * * * Findings of fact shall not be set aside unless clearly erroneous, and due regard shall be given to the opportunity of the trial court to judge the credibility of the witnesses. * * *"

PATENT OFFICE RULE 2:

" * * * The action of the Patent Office will be based exclusively on the written record in the Office * * *". (pg. 12, Rules of Practice in Patent Cases/1970).

PATENT OFFICE RULE 75(e):

"(e) Where the nature of the case admits, as in the case of an improvement, any independent claim should contain in the following order, (1) a preamble comprising a general description of all the elements or steps of the claimed combination which are conventional or known, (2) a phrase such as 'wherein the improvement comprises,' and (3) those elements, steps and/or relationships which constitute that portion of the claimed combination which the applicant considers as the new or improved portion." (pg. 37, Rules of Practice in Patent Cases/1970).

STATEMENT OF THE CASE.

Federal jurisdiction of this patent controversy in the court of first instance was predicated on 35 U. S. C. 271 and 28 U. S. C. 1338(a).

The District Court held that claims 4 and 5 (the only claims involved in the litigation) of patent 3,424,479[1] were invalid for "obviousness". On appeal the Court of Appeals for the Fifth Circuit reversed and held the claims valid.

Brunner & Lay stipulated that some of its production fell within the metes and bounds of claims 4 and 5. The District Court held that other products of Brunner & Lay (those rods on which the "groove" at the crest of the thread was at least briefly interrupted by being closed) did not infringe claims 4 and 5. This holding of the District Court was not appealed.

Claims 4 and 5 relate to drill rods. Drill rods are employed in drilling holes in rock to connect the bit at the bottom of the hole to the above-ground, percussive hammer. Successive rods are connected together by threaded couplings into which the threaded ends of the rods are screwed. The prior art drill rods being sold by the plaintiff, the defendant and other competitors included all of the features described in the claims in suit except that these commercial rods did not have (1) the threading throughout their length, and (2) were not roll threaded[2] and thus did not have a groove at the crest of the threads throughout the length of the rod. After Ingersoll-Rand introduced the drill rod roll-threaded throughout its length, Brunner & Lay also commenced marketing that rod along with its existing line of rods. This litigation followed.

A more complete statement of the facts is found in the Addendum, p. A36.

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1. p. A1 herein.
2. A well known prior art practice for producing threads.

REASONS FOR GRANTING THE WRIT.

I.

May the Court of Appeals Merely Ignore the Findings of Fact of the District Court and Independently Make Its Own Findings of Fact in Conflict with the Findings of the District Court Which Are Not Shown to Be "Clearly Erroneous"?

It is important to the efficient administration of the federal court system that the fact issues not be retried in the Court of Appeals when the District Court's findings thereon are not "clearly erroneous".[3] This is, of course, a major part of the reasoning behind Rule 52(a) FRCP.

With respect to the issue of "obviousness"[4] the Court of Appeals stated:

> "Here the controlling facts are undisputed."

Yet at the very crux of what the Court of Appeals finds to be novel and unobvious, the facts recited by the Court of Appeals are directly contrary to the findings of fact of the District Court.[5] The District Court's findings of fact were based upon oral testimony at the trial, as well as upon depositions, patents and printed publications.[6] They exhibited independent thought

3. This is particularly true in cases involving scientific principles, e.g., patent cases: *Graver Tank & Mfg. Co. et al.* v. *Linde Air Products Co.*, 339 U. S. 605, 610, 94 L. Ed. 1097, 70 S. Ct. 854 (1949).

4. 35 USC 103.

5. The findings of fact of the District Court had not been challenged by the appellant; thus, the appellant, the appellee and the District Court were in effect in agreement as to facts contrary to those recited by the Court of Appeals. The appellant's brief had said: "In the present case, there was no dispute as to the basic facts."

6. That the District Court did not prepare an opinion does not detract from the weight to be given to his findings of fact: *United States* v. *El Paso Natural Gas Co. et al.*, 376 U. S. 651, 656, 12 L. Ed. 2d 12, 84 S. Ct. 1044 (1964).

since not all of the findings proposed by the defendant were adopted, some of defendant's were modified and some were prepared by the Court.

The Court of Appeals for the Fifth Circuit in deciding this appeal has followed standards of review contrary to those applied in other circuits.[7] It has also decided this federal question in conflict with other decisions of this Court.[8] To the extent that the decision made some effort to comply with the "clearly erroneous" requirement, the standard employed was in conflict with the decisions of other circuits[9] and with the decisions of this Court.[10] The following are specific instances in which, at points crucial to the decision that the patent in suit is valid, the Court of Appeals ignored the findings of fact of the District Court and substituted its own or incorrectly applied the "clearly erroneous" test of Rule 52(a):

> A. **District Court:** Drill rods threaded throughout their lengths were known. **Court of Appeals:** Full length threading is novel and unique.

Under the heading "The Nonobviousness of the Differences" the opinion of the Court of Appeals discusses what are the two features that, in its view, justifies the grant of a patent monopoly to I-R.[11] This discussion commenced:

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7. E.g. *Hadco Products, Inc.* v. *Walter Kidde & Co.*, 462 F. 2d 1265, 3rd Cir. 1972. *LaSalle Street Press Inc.* v. *McCormick and Henderson, Inc.*, 445 F. 2d 84, 7th Cir. 1971. *Bowser, Inc.* v. *Filters, Inc. et al.*, 396 F. 2d 296, 9th Cir. 1968.

8. *United States* v. *United States Gypsum Company et al.*, 333 U. S. 364, 395, 92 L. Ed. 746, 68 S. Ct. 525 (1948). *U. S.* v. *National Association of Real Estate Boards et al.*, 339 U. S. 485, 495, 94 L. Ed. 1007, 70 S. Ct. 711 (1950). *Zenith Radio Corporation* v. *Hazeltine Research, Inc. et al.*, 395 U. S. 100, 123, 23 L. Ed. 2d 129, 89 S. Ct. 1562 (1969).

9. Footnote 7 *supra.*

10. Footnote 8 *supra.*

11. The claims in suit are a mix of features old and new, without distinguishing which is which. In this respect the claims violate the decision of this Court in *Lincoln Engineering Co.* v. *Stewart-Warner Corp.*, 303 U. S. 545, 549, 82 L. Ed. 1008, 58 S. Ct. 662 (1937); and patent office rule 75(e), p. 3 hereof.

> "Uniquely, the drilling rod disclosed by the 479 patent was to be continuously threaded from end to end and its geometry was required to be uniform."[12]

Subsequently the opinion refers to "the novelty of full length threading". These statements of a purported fact are in direct conflict with the District Court's Finding of Fact No. 9 which includes the statement that in the prior art "it was known that a drill rod could be threaded thoughout its length" and in conflict with Finding of Fact No. 11 which states that the Court agrees with the decision of the patent office examiner to the effect that the "providing of threads throughout the length of a drill rod did not constitute an unobvious advance in the art so as to justify the grant of a patent therefor." These findings of fact of the District Court were not attacked by the Court of Appeals as "clearly erroneous"; the Court of Appeals merely ignored them and stated the facts to be different.

In this respect, the Court of Appeals is not only at loggerheads with the findings of the District Court, but also is in the position of finding unique a practice which (1) Ingersoll-Rand has admitted to be old, (2) the patent office examiner held to be old (and the holding was acquiesced in by I-R), and (3) is established by evidence in the record to be old. Thus, when Ingersoll-Rand had a patentability search made before the patent application was filed, that search turned up prior art patent 2,733,943 to Nater showing a drill rod having a uniform cross section throughout its length and which included the following discussion with respect to that drill rod:

> "A further object of my invention is to preferably form the [drill] rod of rectangular cross section and wherein the rod is twisted or forged into its spiral form the corner edges of the rod constituting *the coarse pitch threads*." (Emphasis added.)

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12. Other than the requirement for threading from end to end, there is nothing in the language of claims 4 or 5 that requires the cross section to be uniform.

In its patentability opinion of December 1, 1964, the Ingersoll-Rand patent department said:

> "The Butler and Nater references * * * both disclose a drill rod of uniform cross section including a continuous thread throughout its length * * *."

In reply, the inventor Ditson agreed. This is, of course, a part of the record in this case. Thus, even if a contention were made that the findings of fact of the District Court in this respect were "clearly erroneous" (which contention was not made by the Court of Appeals), such a contention would be baseless in the light of the evidence in the record. BUT THE OPINION OF THE COURT OF APPEALS SAYS THAT THIS FEATURE IS UNIQUE AND NOVEL.

One of the prior art practices of avoiding the necessity for rethreading worn or broken rods in the field was to provide extra threads at the ends of the rods so that the worn or broken ends could merely be cut off and the coupling then screwed onto the extra remaining threads. This was covered by a finding of fact of the District Court as follows:

> "10. Prior to the date of invention of Ditson, et al, and more than one year prior to the date when the first application for the patent in suit was filed, it was known to provide excess thread on the ends of a drill rod so that when the rod became worn at the ends, the ends could be cut off and the coupling reattached to the remaining thread without the necessity of rethreading the rod. This is exemplified by prior art U. S. patent 3,211,484, issued October 12, 1965 (and having a filing date of October 30, 1963). The threading of a drill rod its full length is merely carrying this concept to its extreme and is an obvious variance of said prior art knowledge."

With respect to this finding the decision of the Court of Appeals stated:

> "The district court also concluded that the threading of a drill rod for its full length merely carried the prior art concept of creating one or two sets of threads at each end

of a rod to the next obvious stage. *The problem for this conclusion is that no proof was adduced that this had ever been done, attempted or suggested.*" (Emphasis added.)

The patent referred to in the District Court's finding of fact includes the following statement:

> "The present invention aims at an improvement in this respect by manufacturing the extension [drill] rods with an extra threaded portion adjacent to the end thread and having the same length as the end thread. When the end thread breaks or is worn out it is only cut away and the extra thread forms the new thread."

Also, prior art patent 236,774 states:

> "Our object is the production of an effective striking-drill * * *; third, that by such uniform contour any part or section of the drill, if broken at any point in its length, may be effectively used without forging [rethreading] the same; * * *."

Further in this respect, there were also two witnesses who testified (one by deposition and one at the trial) that this practice of providing extra threads at the ends of the rod had actually been used on drill rods since the early 1960's or before. These drill rods, which needed only three to four inches of thread at the ends to extend into the coupling, were provided with up to thirty-six inches of thread at the ends of the rods. THUS THE ASSERTION BY THE COURT OF APPEALS THAT THERE WAS NO SUPPORT IN THE EVIDENCE THAT THE PRACTICE OF PROVIDING EXTRA THREADS AT THE ENDS HAD EVER BEEN "DONE, ATTEMPTED OR SUGGESTED" IS JUST PLAIN CONTRARY TO THE RECORD.

> B. **District Court:** Thread rolling following recommended practice leaves an open seam or groove. **Court of Appeals:** Normal thread rolling leaves only a barely visible, or invisible seam or crevice.

The second of the allegedly unobvious features which purportedly justified the sustaining of the patent was the existence

of the groove at the crest of the thread throughout its length.[13] Here again there was a difference in fact finding between the District Court and the Court of Appeals as to the novelty of this feature, the Court of Appeals predicating its holding of patentability[14] upon the purported novelty and uniqueness of this groove, to-wit:

> "While the art of roll-forming threads contained the knowledge that this process could be stopped at an early stage of completion and that the results would be to leave a gap or groove at the crest of the threads, it also taught that normal use of this thread-forming process called for it to be carried further to the point which left only a barely visible, or invisible seam or crevice."[15]

This is contrary to the findings of fact of the District Court and to the evidence and these findings were not said to be clearly erroneous. The following are extracts from the findings of fact of the District Court:

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13. In filing the patent application and in agreement before the patent office it was contended that the groove was unique because it provided a space to hold lubricant. The patent office demonstrated this concept to be old by Italian patent 513,952. At the trial nothing was said about lubrication, but evidence was presented that a groove (open seam) had less stress-failure inducing characteristics than a closed seam. In 1945 this Court held that that specific concept did not amount to patentable invention in *General Electric Co.* v. *Jewel Incandescent Lamp Co. et al.*, 326 U. S. 242, 90 L. Ed. 43, 66 S. Ct. 81.

14. The opinion refers to the presence of the groove as "the essence of the invention".

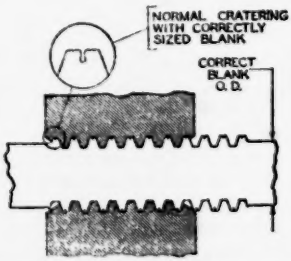
15. If the court intended to give some special meaning to the term "groove" (other than a seam whose walls were apart), it should be noted that the patent does not define the term "groove", nor does it give any indication that it must be of a particular width. There is no evidence that this is an art recognized term, *i.e.*, has some special meaning. Thus, if it is necessary that the opening be of some particular width in order to comply with the patentee's requirements (whatever they may be) for being a "groove" then the patent fails to satisfy the statutory requirement of disclosing and defining the invention (35 U. S. C. 112, 2nd par.). *General Electric Co.* v. *Wabash Appliance Corporation*, 304 U. S. 364, 368, et seq., 82 L. Ed. 1402, 58 S. Ct. 899 (1938). *Graver Tank & Manufacturing Company* v. *Linde Air Products Company*, 336 U. S. 271, 277, 93 L. Ed. 672, 69 S. Ct. 535 (1949).

"4. The term 'groove' as used in the patent in suit requires that there be a finite width, between the walls that form the seam, from the surface of the seam to the base thereof. To the extent that the seam does not meet this requirement, it is not a groove within the meaning of the patent.

"13. * * * The recommended [prior art] practice of those familiar with thread rolling was that the seam be open. Such an open seam if of certain dimensions corresponds to what the patent in suit refers to as a 'groove'. * * *

"14. Prior to the date of invention of Ditson, et al, and more than one year prior to the date on the first application for the patent in suit was filed, it would have been obvious to one skilled in the art to form threads on drill rods by the thread rolling process and, if following the known recommended procedures, the stock were of such size as to keep the seam of the crest open, the resulting thread on the drill rod would have a groove at the crest of the thread throughout the length of the thread."

As illustrative of the evidence that was introduced into the record to show the prior art practice of having an open seam at the crest of the threads, the engineer for Landis Machine who designed the initial thread forming dies for Ingersoll-Rand testified that he always recommended that at least 25% of the width of the crest of the thread be a seam, *i.e.* be open to form a "groove". The chief engineer of Landis Machine also testified as to the prior art practice of recommending an open seam at the crest of the threads and to illustrate what he meant with regard to this open groove he referred to the following illustration of a publication:[16]



16. This 1966 publication may not have been quite early enough to itself be prior art, but it illustrates the witness' testimony as to the prior art. For other prior art see p. A38.

Also the prior art Italian patent which teaches the use of depressions on threads to hold a lubricant[17] states that this may be employed in a manner where "the crest surface [of the threads] are equipped with grooves".

C. **District Court:** The patent office examiner did not have the best prior art. **Court of Appeals:** The patent office considered the closest prior art.

The opinion of the Court of Appeals states:

> "However, where, as here it is shown that the patent office considered prior art as close to the patented invention as any suggested to the court, * * *."

That statement is directly contrary to the following finding of fact of the District Court:

> "16. The Examiners in the U. S. Patent Office who handled the applications for the patent in suit held that a drill rod having threads throughout its length, *which threads were produced by rolling*, was not an unobvious advance in the art justifying the grant of a patent therefor. The applicant acquiesced in that decision by adding another limitation (i.e. the groove at the crest of the threads for the full length thereof) to the claims to the drill rod to obtain the grant of a patent. The Court agrees with that decision of the Patent Office Examiner. The Examiner was apparently not aware that this additional limitation was a necessary result of producing rolled threads by recommended techniques. In this respect, the Examiners in the Patent Office apparently did not have the best available prior art." (Emphasis in original.)

Also, see the discussion commencing on page 15 as to the action of the Court of Appeals in substituting assumptions as to the knowledge of the patent office examiner for the facts as shown by the patent office record.

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17. If I-R discerned an advantage (not previously appreciated) in following the prior art practice of leaving an open seam at the crest of the threads, that does not justify the grant of a patent to it monopolizing the product so produced; see p. 21.

D. **District Court:** (No finding—no evidence). **Court of Appeals:** A synergistic effect exists between threading full length and use of groove.

Under the heading, "The Nonobviousness of the Differences", the opinion of the Court of Appeals states:

> "Such combination uniformity of cross-section and unusual thread formation produced the *synergistic* result which must obtain when combinations of known elements are brought together in a new nonobvious combination. *Anderson's-Black Rock, Inc.* v. *Pavement Salvage Co.*, 396 U. S. 57, 90 S. Ct. 305, 24 L. Ed. 2d 258 (1969)." (Emphasis added.)

In holding the patent invalid in the *Black Rock* case this Court said:

> "A combination of elements may result in an effect greater than the sum of the several effects taken separately. No such synergistic result is argued here."

It appears that the Court of Appeals was seeking to justify the sustaining of the patent in the present instance by asserting the existence of a "synergistic result". The problem is that THERE IS NO EVIDENCE IN THE RECORD OF THIS CASE as to the presence of "an effect greater than the sum of the several effects taken separately", i.e., synergism[18]. Thus

18. There was evidence at the trial that the threading of the rod throughout its length eliminated the transition from a threaded portion to an unthreaded portion; that the existence of that transition in prior art rods had been a source of breakage of the rods; and that by eliminating this transition that source of trouble was eliminated. There was also evidence that a closed seam would be a point of high stress concentration and therefore a likely cause of rod breakage; that this stress concentration would be reduced when the seam was open, i.e. a "groove"; and that therefore there was less likelihood of rod breakage with a groove than with a closed seam. (Incidentally, the patentee does not contend, nor would the facts support it, that the rod with the groove is a better or stronger rod than would be the same rod without any groove or seam at all.) There was no evidence presented (nor would there be any factual basis for such evidence) that either of these stress reductions is greater (i.e. synergism) than would be the situation without the presence of the other stress reduction.

the District Court made no finding that synergism was present. As a matter of fact, none of Ingersoll-Rand's briefs prior to the decision of the Court of Appeals had asserted the existence of a synergism (nor any combined strengthening greater than the sum of the parts).

Is it going to be the practice of the lower courts in applying the *Black Rock* decision to say that a "synergism" exists when they conclude to hold the patent valid, without any factual support in the record; and to deny that a "synergism" exists (quite apart from the state of the record) when it is decided to hold the patent invalid? Certainly this should be a matter of proof as in the case of any other fact matter and not merely be left to the whims of the court rendering the decisions.

> E. **District Court:** The patent office examiner did not have full knowledge of prior art roll-threading practices. **Court of Appeals:** Despite its absence from the patent office record, the examiner is presumed to have knowledge of the pertinent prior art.

Evidence was presented to the District Court as to the prior art practice in the thread forming art which recommended that the threads be rolled with a groove at the crest of the thread. The District Court found that this art was not before the examiner. Without any evidence, the Court of Appeals *assumed* that the examiner had this knowledge. Because of the extreme importance of the question of whether an examiner is to be presumed (1) to have the knowledge, or (2) to not have the knowledge, when the patent office file is devoid of any evidence bearing on the question (that is, there is only the negative evidence of nothing being present) this question is being treated under a separate heading *infra*.

II.

In Determining Whether Certain Pertinent Prior Art Was Considered by the Patent Office Examiner in Issuing a Patent, and Thus Determining the Weight to Be Given to the Presumption of Validity of the Patent in Suit, May the Court of Appeals Assume That the Examiner Had Knowledge of That Prior Art When There Is No Evidence in the Written Record of the Patent Office That the Examiner Was Indeed Possessed of That Knowledge and the Written Record Discloses That the Absence of What That Prior Art Taught Was the Crux of the Examiner's Agreeing That Patentable Subject Matter Was Present?

In 1966 this Court examined the test of patentability under 35 U. S. C. 103 and pointed out that the initial step in making the determination was to determine "the scope and content of the prior art"[19]. In that decision the Court went on to point out "that the primary responsibility for sifting out unpatentable material lies in the patent office."[20] The various circuits, including the Fifth Circuit, apply the rule with virtual uniformity that the failure of the examiner to have the best prior art before him weakens or destroys the presumption of validity expressed in 35 U. S. C. 282[21]. The issue that is of extreme importance to the patent system and with respect to which the decision of the Fifth Circuit in the present instance is in direct conflict with decisions from other circuits is "will the patent office examiner be presumed to have knowledge of crucial prior art

19. *Graham et al.* v. *John Deere Co.*, 383 U. S. 1, 17, 15 L. Ed. 2d 545, 86 S. Ct. 684 (1966).

20. It is significant that the Court of Appeals is here giving I-R patent protection on a structure to which the patent office refused protection; that is, a drill rod roll threaded throughout its length. See the discussion commencing on p. 21.

21. See for example *T. P. Laboratories, Inc.* v. *Huge*, 371 F. 2d 231, 7th Cir. 1966. *Dresser Industries, Inc.* v. *Smith-Blair, Inc.*, 322 F. 2d 878, 9th Cir. 1963. *American Seating Co.* v. *Southeastern Metals Co., Inc.*, 412 F. 2d 756, 5th Cir. 1969.

or will the absence of that prior art from the written record in the patent office be evidence that it was not considered by the patent office examiner?"

To specifically relate this problem to the facts in the present instance, one of the two features held by the decision of the Court of Appeals to be novel and unobvious was the presence of the groove at the crest of the thread. The Court of Appeals refers to the presence of this groove as "the essence of the invention". There was nothing in the written record of the patent in the patent office showing the fact that roll threading will (when applied to objects such as the drill rods here involved) produce a seam at the crest of the thread. Nor is there anything in the written record that the prior art recommendations as to the use of roll threading urged that the threading be performed in a manner such that this seam was open, i.e. the "groove" of the patent. Rule 2 of the U. S. Patent Office states that:

> "The action of the Patent Office will be based exclusively on the written record in the office."

At the trial an expert on patent office practice testified that:

> "In there [the patent office file] there is no indication that the examiner knew or was advised of the fact that when you roll threads you ordinarily get an open seam and, therefore, I would conclude that if he knew that this was the usual result of rolling threads, that he would not have allowed those claims."

Based upon the evidence, the District Court arrived at the following findings of fact:

> "16. The Examiners in the U. S. Patent Office who handled the applications for the patent in suit held that a drill rod having threads throughout its length, *which threads were produced by rolling*, was not an unobvious advance in the art justifying the grant of a patent therefor. The applicant acquiesced in that decision by adding another limitation (i.e. the groove at the crest of the threads for the full length thereof) to the claims to the drill rod to

obtain the grant of a patent. The Court agrees with that decision of the Patent Office Examiner. The Examiner was apparently not aware that this additional limitation was a necessary result of producing rolled threads by recommended techniques. In this respect, the Examiners in the Patent Office apparently did not have the best available prior art.

"17. While the application for the patent in suit was pending before the United States Patent Office, the plaintiff knew that the forming of threads by roll threading would necessarily result in a seam being produced at the crest of the threads, but the plaintiff failed to advise the Patent Office of that fact. Had the Patent Office been aware of that fact, the Court feels that claims 4 and 5 of the patent in suit would not have been issued in a patent." (Emphasis in original.)

The Court of Appeals disposed of these findings of the District Court as follows:

"The trial court held that the patent examiner was *apparently* not aware that this [the presence of the seam] was a necessary result of the roll-threading technique. Such an attribution of lack of expertise to patent office examiners without support in the record is error." (Emphasis in original.)

Thus at the very crux of the point of unobviousness[22] the Court of Appeals assumes that the examiner was aware of the prior art not disclosed in the written record of the patent office and criticizes the District Court for arriving at the conclusion that its absence from the record is evidence that the examiner did not consider it.

The foregoing legal precept being presented by the Court of Appeals for the Fifth Circuit is in direct conflict with decisions of

22. The file history shows that it was not until this phrase describing the existence of the groove was added to the claims that the examiner agreed to allow the claims and he refused to allow an identical claim not describing the groove, but which required that the rod be roll formed.

the Courts of Appeals for other circuits. For example the Seventh Circuit holds:

> "We do not think that the Examiner's failure to cite the pertinent prior art means that he considered the art and found it irrelevant; rather, it may be presumed he overlooked it."[23]
>
> "But the examiner does not appear to have considered several patents and publications produced before the court nor the operation of the Cloud tunnel described at the trial. The statutory presumption has little, if any, force as against relevant prior art *not shown to have been considered* by the Patent Office."[24] (Emphasis added.)

It is important to the patent system that this difference in viewpoint as to what conclusion will be drawn from the fact that the written record in the patent office fails to record prior art dealing with the very point of novelty upon which the validity of the patent is to be considered be resolved. Is the proper viewpoint to assume that the examiner had that knowledge or will its absence from the written record result in a decision that the examiner had not considered this critical prior art?

III.

Should the Fact That the Defendant Copied the Patentee's Product be Regarded as Persuasive Evidence That the Patent Covering the Product Is Valid or Is the Public Policy Best Served by Encouraging Businesses to Compete with Product Covered by Apparently Invalid Patents?

In *Graham et al.* v. *John Deere Co.*[25] this Court pointed out that such secondary considerations as commercial success, etc.

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23. *Milton Manufacturing Co., Inc.* v. *Potter-Weil Corporation et al.*, 327 F. 2d 437, 439, 7th Cir. 1964.

24. *Great Lakes Stamp & Mfg. Co., Inc.* v. *Reese Finer Foods, Inc. et al.*, 402 F. 2d 346, 352, 7th Cir. 1968.

25. 383 U. S. 1, 17 et seq. 15 L. Ed. 2d 545, 86 S. Ct. 684 (1966).

"might be utilized" and "may have relevancy" as indicia of obviousness or nonobviousness. It is readily apparent that the thinking of the Court of Appeals in reversing the decision of invalidity of the District Court was greatly influenced by the fact that Brunner & Lay commenced marketing the product after its initial marketing by Ingersoll-Rand.[26] The third sentence of the Opinion commences, "The imitator". In discussing the secondary evidence of "unobviousness" the court said:

> "Assuming that imitation is the sincerest form of flattery converts Brunner & Lay's president to Ingersoll-Rand's best witness, for he conceded that promptly upon learning of the widespread use and acceptance of Ingersoll-Rand's rod he attempted to copy it. His first attempt at imitation was unsuccessful because he brought equipment which cut rather than rolling the thread form. However, when he finally perfected his infringement, he then reproduced Ingersoll-Rand's advertising copy almost verbatim to extol the virtues of his new product."

Is a manufacturer who seeks to provide the public with competition to be penalized by thereby providing purported evidence to sustain the validity of the patent when the patent would be otherwise invalid? It is submitted that such a practice is contrary to public policy which is to foster competition, providing incentives to develop competition rather than penalizing the competitor. This Court should make it clear that its decision in *Graham* v. *Deere* was not intended to include such evidence as part of the secondary considerations of unobviousness.

The public policy in this respect was thoroughly considered by this Court in the case of *Sears Roebuck & Co.* v. *Stiffel Co.*,[27] which stated:

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26. There is no question but that the Plaintiff was the first to market the product in question, but this does not make that product a patentable invention. As the court said in *Collar Company* v. *Van Dusen*, 90 U. S. 530, 563, 23 L. Ed. 188, 23 Wall. 530 (1874): "Articles of manufacture may be new in the commercial sense when they are not new in the sense of patent law."

27. 376 U. S. 225, 11 L. Ed. 2d 661, 84 S. Ct. 784 (1964).

> "In the present case the 'pole lamp' sold by Stiffel has been held [in this suit] not to be entitled to the protection of either a mechanical or a design patent. An unpatentable article, like an article on which the patent has expired, is in the public domain and may be made and sold by whoever chooses to do so. What Sears did was to copy Stiffel's design and to sell lamps almost identical to those sold by Stiffel. This it had every right to do under the Federal Patent Laws. That Stiffel originated the pole lamp and made it popular is immaterial. 'Sharing in the good will of an article unprotected by patent or trade-mark is the exercise of a right possessed by all—and in the free exercise of which the consuming public is deeply interested.' [case cited]."

If the reasoning of the Fifth Circuit Court of Appeals in this respect is accepted and the result permitted to stand then a manufacturer can never have the temerity to market a competitor's product which is covered by a patent, no matter how clearly it may be shown that the patented product was obvious and thus the patent invalid because to do so would validate this otherwise invalid patent.

A further consideration is that the patent probably can never be tested if a competitor does not start infringing the patent. If the competitor doesn't market the patented product, he cannot be sued for infringement. It is unlikely that he can successfully bring a declaratory judgment action because of the lack of a present controversy. Thus the result of the reasoning applied by the Court of Appeals to validate Ingersoll-Rand's patent will result in invalid patents never being tested and the public consequently being deprived of competition in products covered by invalid patents.

IV.

May a Person Be Granted a Patent Monopoly on the End Result of the Use of a Well-Known Manufacturing Method Employed to Produce a Known Article of Commerce by Reason of the Fact That the Person Was the First to Produce That Article Using That Method?

All of the features of the drill rods identified by claims 4 and 5 were embodied in drill rods in everyday use prior to the invention of the patent in suit, other than (1) the rod being threaded throughout its length and (2) the existence of the groove extending the full length of the crest of the thread resulting from the roll threading. As to feature (1), prior patents show that it was known to have drill rods threaded throughout their lengths so this feature would not sustain the grant of a valid patent. (This was the conclusion of Ingersoll-Rand's patent department; this was admitted by the inventor Ditson; and this was the conclusion of the examiner in the patent office which conclusion was acquiesced in by Ingersoll-Rand, and such prior art patents are in the Record).

As to feature (2), the roll forming of threads was a well-known alternative to cutting threads. This was admitted by the inventor Ditson and the patent office examiner refused to grant claims based on roll forming as an alleged point of novelty. The existence of the groove extending throughout the length of the crest of the threads is the necessary, because inherent, result of the manufacturer following the prior art recognized prudent practice for making threads by the roll threading process. Such prudent practice was well established in the prior art.

Thus the effect of the patent (if it is held valid) is to prevent competitors from making a known product (a drill rod threaded throughout its length) by a well-known threading process (roll threading) unless the competitor does not properly perform the

roll-threading operation (that is, he endangers his equipment by closing the seam).[28] To permit a patent to have this effect is to overthrow a long-established precedent established by this Court against permitting such patents to be viable. For example, in the case of *Lovell Manufacturing Co.* v. *Cary*[29] the patent in suit related to a process for treating wire for springs used in upholstery. The patentee was the first to treat such wire in the manner claimed, but it was shown that the process previously had been applied to clock springs. This Court held the patent invalid and stated:

> "But it does not amount to invention to discover that an old process is better in its results, when applied to a new working [different object], than would have been expected, the difference between its prior working and the new working being only one of degree and not one of kind. It has been often held that the mere fact that one who uses a patented process finds it applicable to more extended use than has been perceived by the patentee, is not a defence to a charge of infringement. It follows necessarily that the public cannot be deprived of an old process because some one has discovered that it is capable of producing a better result, or has a wider range of use than was before known."[30]

More recently, this Court had before it the question of whether the use of one type of pump tube rather than another constituted patentable invention and held that it did not, saying:

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28. The patent office examiner refused to allow a claim to a drill rod having roll formed threads throughout its length, but which did not call for the groove.

29. 147 U. S. 623, 634, 37 L. Ed. 307, 13 S. Ct. 472 (1893).

30. Perceiving a new advantage does not justify the grant of a patent to the perceiver as this Court said in *New York Scaffolding Co.* v. *Chain Belt Co.*, 254 U. S. 32, 37, 65 L. Ed. 116, 41 S. Ct. 21 (1920): "We yield to the assertion of counsel that he [the inventor of the patent in suit] cannot be deprived of an advantage because he did not discern it, but the same concession must be given to Murray [the developer of the prior art apparatus]. He was entitled to all of the benefit that he claimed for his device, or that can be given to it by formal changes."

> "It is elemental that the mere substitution of equivalents which do substantially the same thing in the same way, even though better results may be produced, is not such an invention as will sustain a patent. [cases cited]". [31]

In the *Black Rock* case[32] this Court said:

> "Moreover, Congress may not authorize the issuance of patents whose effects are to remove existent knowledge from the public domain, or to restrict free access to materials already available."

Thus the decision of the Court of Appeals has established a precedent for a revolutionary new rule of law in patent cases to the effect that the first to apply a known process to the manufacture of a known object is entitled to a patent monopoly on that object. Such a revolutionary concept should be rejected.

V.

Does the Cancellation of a Claim, Which Claim Was Rejected by the Patent Office on Prior Art, Estop the Patentee from Subsequently Contending That the Subject Matter of That Claim Was Patentable?

A preliminary discussion of just what is the issue may aid in avoiding irrelevant matters. The situation being considered is one where an applicant for a patent claims a structure comprising elements A plus B plus C. The examiner rejects this claim as unpatentable in view of the prior art and the applicant then changes his claim (either by amendment or substituting a new claim) so that the object now sought to be patented comprises elements A plus B plus C *and D*. The question is whether it is established as a matter of law that this sequence of actions establishes that the object comprising A plus B plus C is unpatentable (i.e., would be "obvious" to a man skilled in the art)

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31. *Dow Chemical Co.* v. *Halliburton Oil Well Cementing Co.*, 324 U. S. 320, 330, 89 L. Ed. 973, 65 S. Ct. 647 (1945).

32. *Anderson's-Black Rock, Inc.* v. *Pavement Salvage Co., Inc.*, 396 U. S. 57, 24 L. Ed. 2d 258, 90 S. Ct. 305 (1969).

or can the patentee later relitigate this question? The question is NOT whether element D when combined with elements A plus B plus C creates a synergistic result justifying the grant of a patent.[33]

The doctrine of "file wrapper estoppel" which is based on a corresponding factual background, but which pertains to matters of infringement rather than patentability, is well recognized. But the existence of that parallel concept does not preclude the second doctrine, now under consideration, which determines from the patent office file what is established as being old and not patentable.

The decision of the Court of Appeals asserts:

> "In sum, a patentee who is estopped from attempting to enlarge the scope of his monopoly by asserting infringement by a competitor's product which is only covered by the rejected patent claim, is not precluded from contending that the patent claim before amendment was erroneously rejected by the patent office *for the purpose of showing that his patent as issued is nonobvious.*" (Emphasis in original.)

What the Court of Appeals contends to be erroneous is exactly what was done by this Court in *Graham et al.* v. *John Deere Co. et al.*[34] Commencing with the heading of "The Invalidity of the Patent" (page 564) this Court discussed how the applicant limited his claims during the course of the patent office proceedings. It then stated the applicable law that:

> "Here, the patentee obtained his patent only by accepting the limitations imposed by the Examiner. The claims were carefully drafted to reflect these limitations and Cook Chemical is not now free to assert a broader view of Scoggin's invention. The subject matter as a whole reduces, then, to the distinguishing features clearly incorporated

33. It is accepted as good law that a patentable invention can be created by an unobvious combination of elements individually old in the art.

34. 15 L. Ed. 2d 545, 564-566, 383 U. S. 1, 86 S. Ct. 684 (1966).

into the claims. We now turn to those features." (page 565.)

The Court thus accepted as established (an estoppel) that what was in the claim prior to the amendment did not constitute patentable invention, and it proceeded to examine the added features, one by one to see if each was an "unobvious" advance in the art.

In *Blonder-Tongue Laboratories, Inc.* v. *University of Illinois Foundation et al.*,[35] this Court overruled the long standing rule that a patentee was not estopped from again asserting his patent which had once been held invalid. In part the justification for this reversal of policy was the necessity for efficient judicial administration.[36] For just the same reason an applicant for a

35. 402 U. S. 313, 28 L. Ed. 2d 788, 91 S. Ct. 1434 (1971).

36. "Authorities differ on whether the public interest in efficient judicial administration is a sufficient ground in and of itself for abandoning mutuality, but it is clear that more than crowded dockets is involved. The broader question is whether it is any longer tenable to afford a litigant more than one full and fair opportunity for judicial resolution of the same issue. The question in these terms includes as part of the calculus the effect on judicial administration, but it also encompasses the concern exemplified by Bentham's reference to the gaming table in his attack on the principle of mutuality of estoppel. In any lawsuit where a defendant, because of the mutuality principle, is forced to present a complete defense on the merits to a claim which the plaintiff has fully litigated and lost in a prior action, there is an arguable misallocation of resources. To the extent the defendant in the second suit may not win by asserting, without contradiction, that the plaintiff had fully and fairly, but unsuccessfully, litigated the same claim in the prior suit, the defendant's time and money are diverted from alternative uses—productive or otherwise—to relitigation of a decided issue. And still assuming that the issue was resolved correctly in the first suit, there is reason to be concerned about the plaintiff's allocation of resources. Permitting repeated litigation of the same issue as long as the supply of unrelated defendants holds out reflects either the aura of gaming table or a lack of discipline and of disinterestedness on the part of the lower courts, hardly a worthy or wise basis for fashioning rules of procedure. *Kerotest Mfg. Co.* v. *C-O-Two Co.*, 342 U. S. 180, 185, 92 USPQ 1, 3 (1952). Although neither judges, the parties, nor the adversary system perform perfectly in all cases, the requirement of determining whether the party against whom an estoppel is asserted had a full and fair opportunity to litigate is a most significant safeguard."

patent who accedes to an examiner's determination that what was sought to be patented is unpatentable, and who accepts a more limited patent, should not later be permitted to reverse his stand and contend that the abandoned subject matter really was patentable after all. He has had his "day in court" and his voluntary abandonment of what he had sought to patent should estop him from relitigating the issue in an infringement suit. In such suit the starting point of the trial court should be that what was thus abandoned is old and unpatentable—therefore, do the features added thereto to obtain the grant of the patent so cooperate with the previously claimed (and abandoned) features so as to create an "unobvious" combination. It is a waste of the time of the trial court to relitigate the issue of whether what was given up in the patent office constitutes patentably novel subject matter. Yet that is the effect of the decision sought to be reviewed herein.

This principle is significant in the present litigation because Ingersoll-Rand presented a claim[37] in the course of the prosecution of the application which was identical to claim 4 of the patent except that it did not include the final phrase "and a single continuous groove on the crest of said attachment thread continuously throughout its length." The examiner refused to allow this claim, finding that it was "obvious" in view of the prior art and the claim was abandoned by the applicant. In the light of the examiner's refusal to allow this claim and his agreeing to allow the identical claim when the final phrase relating to the continuous groove was added, it is inconceivable to assume (as the Court of Appeals did) that the examiner was well aware of the fact that the presence of the continuous groove was the necessary and inherent result of roll forming of threads in accordance with recommended practices.

37. "26. A drill rod comprising an elongated body including a bore axially therethrough and having a single, spiral, single pitch, attachment thread which is roll formed on said body to extend circumferentially therearound continuously throughout the length of said body, the helix angle of said attachment thread being less than 15°."

VI.

Do the "Rules of the Game" Permit an Applicant for a Patent to Be Less Than Candid with the Patent Office, or Does Such Conduct Create an "Exceptional Case" Dictating the Award of Attorneys Fees to a Defendant in an Infringement Action in Which the Patent is Held Invalid?

The District Court held the patent invalid. It also entered a finding of fact in which it recognized that Ingersoll-Rand was less than candid with the Patent Office in the prosecution of the application but said that such conduct was within the "rules of the game". It therefore refused to award attorneys fees to the successful defendant under 35 U. S. C. 285. Inasmuch as the Court of Appeals held the patent valid it did not pass on this issue of claim for attorneys fees. This Court should make it clear to all of the lower Federal Courts that the "rules of the game" do not condone an applicant for a patent being anything less than candid with the patent office.

The holding of the District Court is in direct conflict with the positions taken in other circuits and a uniform rule should be established. For example in the case of *Monolith Portland Midwest Co.* v. *Kaiser Aluminum & Chemical Corp.*[38] the court said:

> "A patent applicant has a duty to the Patent Office to make a full and fair disclosure of all facts which may affect the patentability of his invention. A breach of that duty prevents the Patent Office from properly performing its function of preventing the issuance of unlawful patent monopolies. [case cited]
>
> "A patent applicant's breach of duty to the Patent Office is revelant in determining not only the validity of his patent, but also his good faith in maintaining a subsequent infringement action. An applicant's fraud on the Patent Office is enough standing alone to convert his later in-

38. 407 F. 2d 288, 294, 9th Cir. (1969).

> fringement action into an exceptional case within the meaning of section 285. ***But conduct short of fraud and in excess of simple negligence is also an adequate foundation for deciding that a patent action is exceptional.*** Such conduct is a serious breach of the patentee's duty to the Patent Office. ***The party who succeeds in invalidating the unlawful patent performs a valuable public service. It is appropriate under such circumstances to reward the prevailing party by giving him attorney's fees for his efforts, and it is equally appropriate to penalize in the same measure the patentee who obtained the patent by his wrongdoing.*** [cases cited]". (Emphasis added.)[39]

Among the actions of Ingersoll-Rand in failing to reveal the true fact, or to reveal all the pertinent facts, to the patent office are the following:

A. After having made a patentability search which revealed the fact that drill rods threaded throughout their length were old in the art and having recognized that this was an unpatentable concept, Ingersoll-Rand (1) proceeded to file a patent application seeking to obtain patent protection on this feature; (2) had the alleged inventors submit an oath to the patent office that this concept was not previously known, etc.; and (3) failed to reveal to the patent office the prior art turned up on its search which, in internal company correspondence, it had admitted rendered the concept unpatentable.

B. Throughout the prosecution of the application, Ingersoll-Rand continued to press for claims that read directly on the prior art and used half truths and misleading arguments in its presentation to the patent office. The following are examples:

---

39. Other pertinent decisions holding that "half truths" and the like are improper conduct are: *Monsanto Co.* v. *Rohm & Haas Co.*, 456 F. 2d 592, 3rd Cir. 1972; *Brand Plastics Company et al.* v. *The Dow Chemical Co.*, 267 F. S. 1010, D. C. Cal. 1970; *Aerodyne Machinery Corporation* v. *Slick Industrial Company*, 169 USPQ 150, D. C. Minn. 1971. Also see: *Contour Saws, Inc.* v. *The L. S. Starrett Co.*, 444 F. 2d 1321, 1st Cir. 1971.

1. Ingersoll-Rand presented papers pertaining to a BLUE RIBBON EQUIPMENT AWARD but failed to disclose the fact that this award was based upon features which the examiner had already held to be unpatentable because of being known to the prior art.
2. As applicant for the patent, Ingersoll-Rand repeatedly argued that a claim which it was seeking the examiner to allow distinguished from prior art references being applied by the examiner in the rejection of those claims as to features which were clearly shown in other references, and it failed to reveal to the examiner that these other references included the features being asserted as justifying patentability.
3. It argued that a presence of the "lubrication" groove was an important feature when the claims did not refer to any such element.
4. It argued that the requirement of the claims that a helix angle of the attachment thread must be less than 15° was a feature justifying patentability, when it well knew that the threads on the rods previously being sold by it and its competitors met this requirement, and that fact was not revealed to the patent office.

C. Prior to the time that the application was filed the plaintiff knew that the presence of a seam at the crest of the threads was a necessary result of the roll threading process, but this fact was never revealed to the patent office. To the contrary, the presence of the open seam was asserted by Ingersoll-Rand as justifying patentability (and was the only element specified in the claims as to which the written record reveals no knowledge on the part of the examiner).

CONCLUSION.

The petition for a writ of certiorari should be granted.

Respectfully submitted,

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ADDENDUM.

Jan. 28, 1969 J. D. DITSON ET AL **3,424,479**

COUPLING AND ROD SYSTEM FOR ROCK DRILLS

Filed Jan. 11, 1966 Sheet 1 of 2

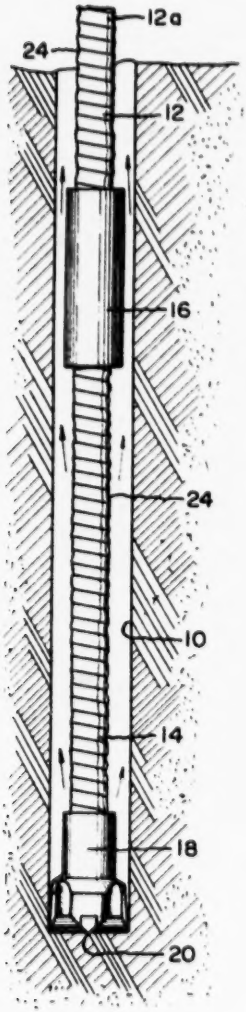

FIG. 1

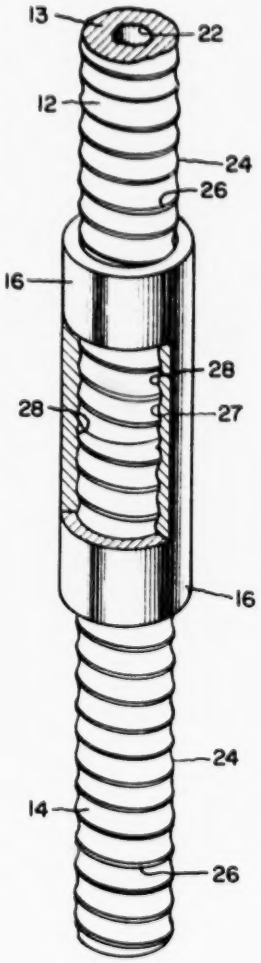

FIG. 2

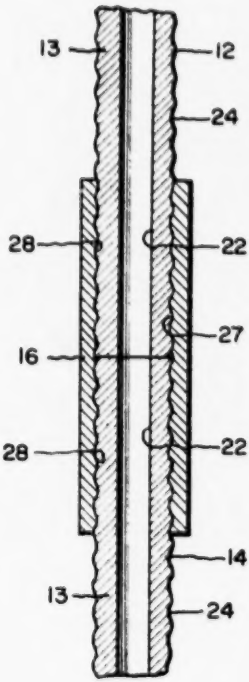

FIG. 3

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Jan. 28, 1969 J. D. DITSON ETAL **3,424,479**

COUPLING AND ROD SYSTEM FOR ROCK DRILLS

Filed Jan. 11, 1966 Sheet 2 of 2

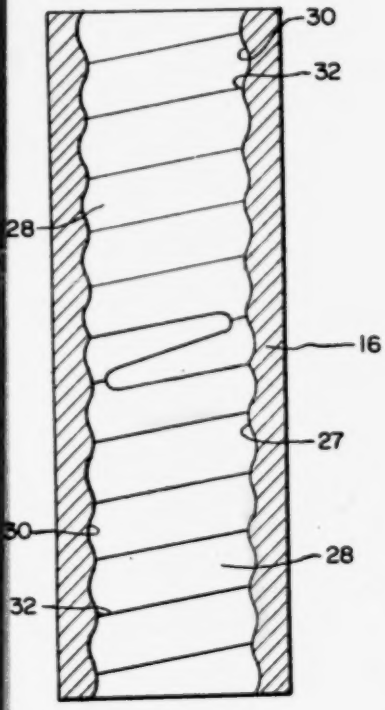

FIG. 4

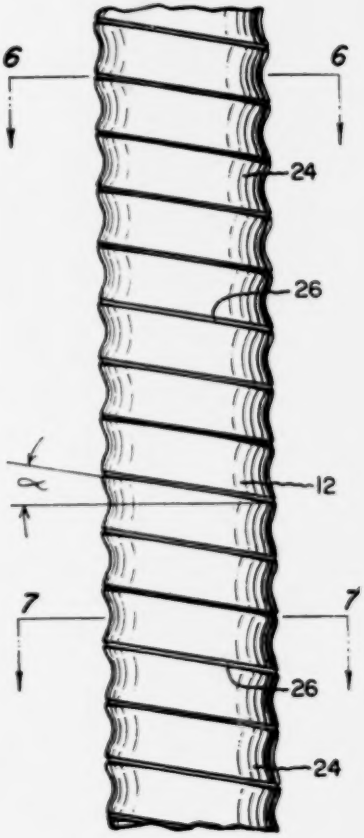

FIG. 5

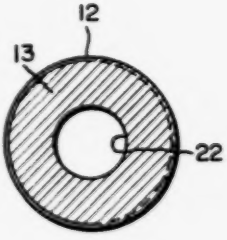

FIG. 6

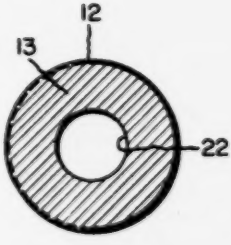

FIG. 7

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United States Patent Office 3,424,479
Patented Jan. 28, 1969

3,424,479

COUPLING AND ROD SYSTEM FOR ROCK DRILLS

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U.S. Cl. 285—94 6 Claims
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ABSTRACT OF THE DISCLOSURE

A rock drill coupling and rod system comprising a coupling member having a bore provided with a pair of circumferentially offset, overlapping threads adapted for connecting a plurality of rods in aligned relationship. In addition, a drill rod provided with a circumferential attachment thread which extends continuously throughout the length of the drill rod.

This application is a continuation-in-part of United State Patent application Ser. No. 455,098, which was filed May 12, 1965, and now abandoned.

This invention relates to rock drill apparatus and has particular reference to a coupling and rod system for rock drills. More specifically, the present invention comprises the provision of a new and improved rock drill coupling and rod system wherein the coupling member is self-locating upon the drill rods and the drill rods are constructed and arranged to enhance the strength and durability of the coupling member.

Basically, a coupling and rod system or coupled rod system for a rock drill comprises a plurality of drill rods which are connected in longitudinal alignment by a coupling member. Conventionally, this coupling member is characterized as being of the full bridge type, the semi-bridge type, or the bridgeless type.

A full bridge type coupling member includes a bridge or abutment which is located midway in the coupling member and extends transversely thereacross. The drill rods coupled thereby are screwed into the coupling member until each abuts the bridge or abutment such that rotary and longitudinal energy of the driving drill rod is transmitted through the coupling member to the driven drill rod. This form of coupling is undesirable in that the coupling member is subject to frequent premature failure due to this necessity that all of the energy transmitted between the drill rods pass through the relatively small mass of the coupling member.

A semibridge type coupling member also includes a bridge or abutment which is located midway in the coupling member and extends transversely thereacross. In this type of coupling member, however, a bore is formed through the bridge or abutment; and a reduced diameter button of smaller cross section than this bore is formed upon the adjacent ends of each of the coupled drill rods such that, upon insertion of the rods into the coupling member, the buttons are in engaging relation. This form of coupling thus overcomes the beforedescribed weakness of the full bridge type coupling member by permitting energy to be transmitted directly from one drill rod to

the other without energy transfer to the coupling member. However, it has been found that the formation of the buttons necessary for this type of coupling reduces the engagement length of the attachment thread in the coupling member for any given length thereof and necessitates additional expense and labor during the reconditioning of the drill rods such as limits the reconditioning flexibility of the coupled rod system.

As conventionally constructed, a bridgeless type coupling member is heavily dependent upon the length of the threaded portions of the drill rods to properly locate the rods. Furthermore, this type of coupling usually requires the formation of a shoulder upon each of the rods to assist in limiting the entrance thereof into the coupling member. It has been found that this shoulder frequently causes premature failure of both drill rods and coupling members.

An object of the present invention is to provide a new and improved rock drill coupling and rod system wherein the coupling member is self-locating upon the drill rods and the drill rods are particularly constructed and arranged to enhance the strength and durability of the coupling member.

Another object of the invention is to provide a new and improved rock drill coupling and rod system of the type set forth wherein the coupling member is self-locating upon the drill rods without the necessity for bridges, abutments, buttons, shoulders, or other protruding or projecting elements which might cause premature coupling or rod failure.

Another object is to provide a new and improved rock drill coupling and rod system of the type set forth wherein the drill rods are particularly constructed and arranged to facilitate reconditioning of the coupling and rod system and to increase the operative life of all components thereof.

Another object is to provide a new and improved coupling and rod system of the type set forth wherein the drill rods are particularly constructed and arranged to clean the hole being drilled.

Another object is to provide a new and improved drill rod which is particularly constructed and arranged to increase the strength of the rod as well as to facilitate its reconditioning.

Another object is to provide a new and improved coupling which is particularly constructed and arranged to be self-locating upon the drill rods which it connects.

Other objects and advantages of the invention will be apparent from the following description taken in connection with the accompanying drawings. It will be understood that changes may be made in the details of construction and arrangement of parts shown and described as the preferred form of the invention has been given by way of illustration only.

Referring to the drawings:

FIG. 1 is an elevational view illustrating the coupling and rod system provided by the present invention in operative position within a hole being drilled;

FIG. 2 is a partially broken away, enlarged perspective view of the coupling and rod system of the invention;

FIG. 3 is a fragmentary sectional view of the coupling and rod system;

FIG. 4 is an enlarged sectional view of the coupling member of the coupling and rod system;

FIG. 5 is a fragmentary view of one of the drill rods of the coupling and rod system;

FIG. 6 is a sectional view through the drill rod shown in FIG. 5 taken on line 6—6 of FIG. 5 looking in the direction of the arrows; and

FIG. 7 is another sectional view through the drill rod shown in FIG. 5 taken on line 7—7 of FIG. 5 looking in the direction of the arrows.

Referring more particularly to the drawings wherein similar reference characters designate corresponding parts throughout the several views, FIG. 1 illustrates generally a coupling and rod system constructed in accordance with the present invention which is operatively disposed within a hole **10** being drilled. More particularly, as will be seen from FIG. 1, the coupling and rod system comprises a first drill rod **12**, a second drill rod **14**, and a coupling member **16** which fixedly connects the drill rods **12** and **14** in conjoined longitudinal alignment.

The first drill rod **12** includes an end portion **12***a* which projects longitudinally from the hole **10** and is operatively connected to a rock drill (not shown) such that the first drill rod **12** receives longitudinal and rotary movement from the rock drill during the operation thereof. The coupling member **16** transmits the rotary movement from the first drill rod **12** to the second drill rod **14** and maintains the first and second drill rods **12** and **14**, respectively, in longitudinal alignment for transmission of longitudinal energy directly from the first drill rod **12** to the second drill rod **14**. The second drill rod **14** is threaded into a drill bit **18** which is located at the drilling surface **20** and directly transmits this rotary and longitudinal movement to the drill bit **18**. Thus, it will be seen that the first drill rod **12**, the second drill rod **14**, and the coupling member **16** which comprise the coupling and rod system of the present invention cooperate to support the drill bit **18** at the drilling surface **20** and transmit drilling movements thereto.

The first drill rod **12** and the second drill rod **14** include cooperating axial bores **22** adapted to supply air or other suitable fluid to the drilling surface **20** for the removal of cuttings therefrom and are identical in construction such as to be readily and simply interchangeable. Due to this identity in construction of the drill rods **12** and **14**, and for the purposes of brevity and clarity of description, the details of construction of the first drill rod **12**, only, will be herein specifically described. It will be understood, however, as shown by the application of reference characters upon the drawings, that all of the detailed description given herein with regard to the construction of the first drill rod **12** is equally applicable to the construction of the second drill rod **14**.

As shown in FIGS. 2 and 5 through 7, the first drill rod **12** includes a cylindrical body **13** which is constructed of uniform circular cross section and includes a constant diameter throughout its length. This uniformity in the cross-sectional diameter of the body **13** of the first drill rod **12** avoids the stress raising factors and possible causes of premature rod failure that are inherently associated with variations in rod cross section and ensures a long operative life of the first drill rod **12**. The construction of the body **13** of the first drill rod **12** of circular cross section facilitates the provision of a lightweight drill rod for any required length thereof and facilitates the self-locating of the coupling member **16** upon the drill rods **12** and **14**.

A single thread **24** is formed circumferentially around the body **13** of the first drill rod **12** and extends continuously throughout the length thereof. The thread **24** is a symmetrical thread of spiral form and is of the single pitch type wherein the pitch of the thread equals the lead thereof. Thus, one revolution of the first drill rod **12** through a 360° angle will axially advance the first drill rod **12** into a similarly threaded bore the longitudinal distance between a point on one spiral of the thread **24** and a corresponding point on the succeeding spiral of the thread **24**.

The thread **24**, as illustrated in FIG. 5, is formed with a helix angle α of not more than 15°. This formation of the helix angle α has been found to be important for the proper locking of the coupling member **16** and the drill bit **18** to the drill rods **12** and **14**. The formation of the helix angle α greater than 15° has been found to provide a thread form which is too steeply inclined to provide a proper locking relationship between the drill rods **12**, **14** and the coupling member **16** and drill bit **18**.

The thread **24**, furthermore, is formed by the rolling process such that the lines of the thread as well as the length thereof are continuous throughout the length of the drill rod **12** and the drill rod **12** is free from abrupt variations in cross section. The thread **24** serves as an attachment means for securing the first drill rod **12** to the coupling member **16** and, as will be seen from FIGS. 2 and 5, is provided, on its crest, with a circumferential groove **26** which extends continuously throughout its length. The groove **26** is adapted to carry a lubricant which may be wiped or otherwise suitably disposed upon the thread **24** for lubricating the portion thereof passing internally into the coupling member **16**.

As the first drill rod **12** and the second drill rod **14** are thus continuously threaded throughout their lengths, the form and quality of the thread **24** provided by the rod manufacturer endures throughout the operative lives of the drill rods **12** and **14**. Therefore, the process of reconditioning a failed or broken rod is simplified to the extent that it merely comprises the cutting off of the failed or broken portion of the rod: and the rod manufacturer may employ special materials and unusual heat treatment processes in the fabrication of the rod without consideration of the field reconditioning problems that previously hereto have limited the processes and materials employed in manufacturing the rod.

Furthermore, the continuous lines of the thread **24** upon each of the drill rods **12** and **14** function as an Archimedes' screw to remove the mud collar that conventionally forms above the drill bit **18** and direct such from the hole **10** during the operation of the rock drill (not shown). More specifically, as will be seen from the direction of the arrows in FIG. 1, the mud collar is directed by the thread **24** on the second drill rod **14** and the pressure circumferentially around the coupling member **16** to the thread **24** on the first drill rod **12** which, in turn, directs this mud collar from the hole **10** to a point (not shown) where the mud may be collected for disposal purposes.

The coupling member **16**, as will be seen from FIGS. 2 through 4, is basically of cylindrical configuration and includes an axial bore **27** of constant diameter which is adapted to receive the first and second drill rods **12** and **14**, respectively. A symmetrical thread **28** of spiral form and single pitch type is started within the bore **27** from each of the opposing longitudinal ends of the coupling member **16**. The threads **28** are adapted to mesh with the threads **24** upon the drill rods **12** and **14** to retain the drill rods **12** and **14** within the coupling member **16** and, as will be later herein shown, are constructed and arranged to facilitate the self-locating of the coupling member **16** upon the drill rods **12** and **14**. The direction of threading of the drill rods **12** and **14** in the bore **27** is, of course, in the direction of the rotation transmitted by the rock drill (not shown) such that there is an inherent tendency to thread the drill rods **12** and **14** into the coupling member **16** during the operation of the rock drill.

The initiating of the threads **28** is carefully mismatched by one-half of the lead thereof such that the helix root **30** of each of the threads **28** is a continuation of the crest **32** of the other thereof at the junctures of the threads **28**. The depth of each of the threads **28** extends beyond the longitudinal midpoint of the coupling member **16** such

that each of the threads **28** is terminated in overlapping relationship with the other thereof. That is to say, each of the threads **28** is terminated immediately beyond the termination of the thread **28** initiated from the opposite end of the coupling member **16** such that, as shown in FIG. 4, the crest **32** of each of the threads **28** merges into the helix root **30** of the other thereof.

During the formation of the threads **28**, the cutting tool (not shown) used to form such within the bore **27** is rapidly withdrawn immediately after the cutting of the final spiral of each of the threads **28**. Thus, the final spiral of each of the threads **28** is terminated without the formation of an undercut such as might weaken the coupling member **16**; and an abrupt limiting stop is formed at the terminating end of each of the threads **28**.

Due to the beforedescribed construction of the coupling member **16**; and an abrupt limiting stop is formed at the **14**, respectively, is able to pass the terminal point of the thread **28** initiated from the longitudinal end of the coupling member **16** opposite to that from which the rods **12** and **14** are inserted. Neither of the drill rods **12** and **14** is able, however, to pass completely through the coupling member **16** due to the separate entities of each of the threads **28**. Thus, it will be seen that the drill rods **12** and **14** will abut within the coupling member **16** before being prevented by the threads **28** from further movement therein.

Thus, the coupling member **16** which is provided by the present invention is self-locating upon the drill rods **12** and **14** due to the beforedescribed construction of the threads **28** and their interaction with the threads **24** on the drill rods **12** and **14**. Furthermore, as this self-locating of the coupling member **16** is dependent only upon the construction of the meshing threads **24** and **28**, it will be seen that there is no necessity for bridges, abutments, buttons, shoulders, or other protruding or projecting elements which might cause premature rod or coupling failure.

As the drill rods **12** and **14** are of constant cross section and are continuously threaded throughout their lengths, it will be seen that they include no variation in cross section which might result in early rod failure and have no shoulders or abutments which might engage the coupling member **16** such as to cause premature failure thereof. Also, this continuous threading of each of the drill rods **12** and **14**, as has been previously herein shown, facilitates reconditioning of the coupling and rod system and assists in the removal of mud from the hole **10**.

The operation of the coupling and rod system of the present invention is believed to be apparent from the foregoing.

From the foregoing it will be seen that we have provided new and improved means for accomplishing all of the objects and advantages of our invention.

What is claimed is:

1. A rock drill coupling and rod system comprising:
- a first rod having a circumferential thread on at least one end;
- a second rod having a circumferential thread on at least one end;
- a coupling member connecting said first and second rods in conjoined longitudinal alignment having an axial bore therethrough receiving said threaded ends of said first and second rods;
- a first thread within said bore initiated adjacent one end of said coupling member and terminating intermediate the ends of said coupling member;
- a second thread within said bore initiated adjacent the other end of said coupling member and terminating intermediate the ends of said coupling member;
- said threads all being of the same hand, said first and second threads being of the same lead, and the threads on each of said rods extending a distance sufficient to allow said rod ends within said coupling member to abut one another; and
- said first and second threads being initiated circumferentially offset by a space of substantially one-half of their lead and extending in overlapping relationship such that the helix root of each of said first and second threads terminates at the crest of the other thereof.

2. A rock drill coupling comprising:
- a body having a bore, adapted to receive the adjacent threaded ends of a pair of aligned rods, which is of constant diameter and extends longitudinally through said body;
- a first thread within said bore initiated adjacent one end of said body and terminating intermediate the ends of said body;
- a second thread within said bore initiated adjacent the other end of said body and terminating intermediate the ends thereof, said first and second threads being of the same lead and hand; and
- said first and second threads being initiated circumferentially offset by a space of substantially one-half of their lead and extending in overlapping relationship such that the helix root of each of said threads terminates at the crest of the other thereof.

3. A rock drill coupling comprising:
- a body having a bore, adapted to receive the adjacent threaded ends of a pair of aligned rods, which is of constant diameter and extends longitudinally through said body;
- a first thread within said bore initiated adjacent one end of said body and terminating intermediate the ends of said body;
- a second thread within said bore initiated adjacent the other end of said body and terminating intermediate the ends thereof, said first and second threads being of the same lead and hand; and
- the helix roots of said first and second threads being offset by substantially one-half of their lead and terminating in overlapping relationship.

4. A drill rod comprising an elongated body including a bore axially therethrough and having a single, spiral, single pitch, attachment thread which is roll formed on said body to extend circumferentially therearound continuously throughout the length of said body, the helix angle of said attachment thread being less than 15 degrees, and a single continuous groove on the crest of said attachment thread continuously throughout its length.

5. A drill rod comprising an elongated body including a bore extending axially therethrough and having a roll-formed helical attachment thread extending circumferentially therearound continuously throughout the length of said body, the helix angle of said attachment thread being less than 15 degrees, and a continuous helical groove extending along the entire length of the crest of said attachment thread.

6. A rock drill coupling and rod system comprising:
- a first rod having a roll formed, attachment thread which exteinds circumferentially around said first rod throughout the length of the latter;
- a second rod having a roll formed, attachment thread which extends circumferentially around said second rod throughout the length of the latter; and
- a coupling connecting said first and second rods in longitudinal alignment, said coupling including a body having a constant diameter bore receiving adjacent ends of said first and second rods;
- said bore being provided with a first thread initiated adjacent one end of said body and terminating intermediate the ends of said body, and a second thread initiated adjacent the other end of said body and terminating intermediate the ends thereof;
- said first and second threads being of the same lead and hand, and the helix roots of said first and second threads being offset by substantially one-half their lead and terminating in overlapping relationship.

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CARL W. TOMLIN, *Primary Examiner.*

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U.S. Cl. X.R.

285—390, 417; 287—117; 85—46; 175—394; 64—1

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,424,479 January 28, 1969

J. D. Ditson et al.

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

Column 5, line 17, "member 16; and an abrupt limiting stop is formed at the" should read -- member 16, each of the first and second drill rods 12 and --. Column 6, line 56, "exteinds" should read -- extends --.

Signed and sealed this 9th day of December 1969.

(SEAL)

Attest:

Edward M. Fletcher, Jr.

Attesting Officer

WILLIAM E. SCHUYLER, JR.

Commissioner of Patents

UNITED STATES DISTRICT COURT
Southern District of Florida

INGERSOLL-RAND COMPANY,
Plaintiff,
vs.
BRUNNER & LAY, INC.,
Defendant.
No. 71-1074-Civ-PF

FINAL JUDGMENT.

In accordance with the Findings of Fact and Conclusions of Law made and filed herein, it is, accordingly—

ORDERED AND ADJUDGED that the plaintiff, Ingersoll-Rand Company, shall take nothing on its complaint and the defendant, Brunner & Lay, Inc., shall be awarded its costs. It is

FURTHER ORDERED AND ADJUDGED that the defendant, Brunner & Lay, Inc., shall take nothing on its counterclaim and that the plaintiff, Ingersoll-Rand Company, shall be awarded its costs incurred in defending the counterclaim, and it is

FURTHER ORDERED AND ADJUDGED that the costs of this action shall be taxed at a later date upon the motion by either party.

DONE AND ORDERED at Miami, Florida this 23rd day of February, 1972.

PETER T. FAY,
United States District Judge.

UNITED STATES DISTRICT COURT

Southern District of Florida

INGERSOLL-RAND COMPANY,
Plaintiff.
vs.
BRUNNER & LAY, INC.,
Defendant.
No. 71-1074-Civ-PF

. This Cause came on for trial before the Court, without a jury, witnesses having been called and the exhibits introduced into evidence, and the Court having given due consideration to all testimony, exhibits, argument of counsel and authorities cited, and being fully advised, findings of fact and conclusions of law are hereby entered.

FINDINGS OF FACT

1. The plaintiff charges the defendant with infringement of only claims 4 and 5 of the patent No. 3,424,479, issued January 28, 1969 (the patent in suit). The plaintiff has withdrawn its charge of infringement of the remaining claims of the patent.

Claim 4 reads as follows:

> "4. A drill rod comprising an elongated body including a bore axially therethrough and having a single, spiral, single pitch, attachment thread which is roll formed on said body to extend circumferentially therearound continuously throughout the length of said body, the helix angle of said attachment thread being less than 15 degrees, and a single continuous groove on the crest of said attachment thread continuously throughout its length."

Claim 5 reads as follows:

> "5. A drill rod comprising an elongated body including a bore extending axially therethrough and having a roll-formed helical attachment thread extending circumferentially therearound continuously throughout the length of said body, the helix angle of said attachment thread being less than 15 degrees, and a continuous helical groove extending along the entire length of the crest of said attachment thread."

2. In the rolling of threads in metals of the general type that would be used in drill rods, a discontinuity occurs at the crest of the thread, which discontinuity is variously known in the thread rolling industry as a "seam", "void" and "crater".

3. In the rolling of threads the metal is pushed from what is to be the "root" or base of the threads outwardly to each side to form what is to be the raised portion of the thread. With the metals of the type in question, this flowing metal first forms a relatively wide seam (at what is to be the raised part of the thread), then a progressively narrower seam, and finally, if the rolling process is continued, a closed seam which is a vertical discontinuity extending downwardly from the crest of the raised part of the thread. This always has been true when the thread rolling process has been practiced, and it has been practiced for at least fifty years.

4. The term "groove" as used in the patent in suit requires that there be a finite width, between the walls that form the seam, from the surface of the seam to the base thereof. To the extent that the seam does not meet this requirement, it is not a groove within the meaning of the patent.

5. Claims 4 and 5 of the patent in suit require that the groove extend the full length of the drill rod. The Patent Office refused to grant claims which did not have this requirement and the plaintiff acquiesced in this decision of the Patent Office by inserting such a requirement into all of the drill rod claims that ultimately issued in the patent in suit. A drill rod which does

not have a groove extending its full length does not come within the scope of claims 4 and 5 of the patent in suit.

6. In a significant number of the drill rods manufactured and sold by the defendant, the seam is at least partially closed over a portion of the length of the rod (said portion often being an end of the rod, where "lubrication" would be required if that concept was of any real significance). Such rods do not come within the scope of claims 4 and 5 of the patent in suit.

7. The art involved in the subject matter of the patent in suit is that of metal working generally and that of forming threaded steel rods in particular. To the extent that reference is made herein to one skilled in the art, this is the art to which reference is made.

8. Prior to the date of invention of Ditson, et al, and more than one year prior to the date when the first application for the patent in suit was filed, it was conventional in the United States for drill rods (made and sold by the plaintiff, the defendant and others) to comprise the following elements:

> an elongated body;
>
> a bore axially therethrough;
>
> a single, spiral, single pitch attachment thread extending circumferentially therearound (at the ends only), the helix angle of said attachment thread being less than 15 degrees.

Said drill rods conventionally made and sold in the United States did not have the following additional elements set forth in claims 4 and 5:

> the attachment threads (a) were not roll formed and thus did not have the continuous helical groove extending along the crest of the entire length thereof and (b) did not extend the full length of the rods.

9. Prior to the date of invention of Ditson, et al, and more than one year prior to the date when the first application for the patent in suit was filed, it was known that a drill rod could be threaded throughout its length and that advantages would be

thereby achieved, e.g., when broken, the end could be reinserted in its socket without the necessity for rethreading. This is exemplified by prior art U. S. Patent 236,774, issued January 18, 1881. Other prior art patents such as British Patent 26,810, issued June 16, 1910, and U. S. Patent 1,904,675, issued April 18, 1933, show drill rods or pipe threaded throughout their length.

10. Prior to the date of invention of Ditson et al, and more than one year prior to the date when the first application for the patent in suit was filed, it was known to provide excess thread on the ends of a drill rod so that when the rod became worn at the ends, the ends could be cut off and the coupling reattached to the remaining thread without the necessity of rethreading the rod. This is exemplified by prior art U. S. Patent 3,211,484, issued October 12, 1965 (and having a filing date of October 30, 1963). The threading of a drill rod its full length is merely carrying this concept to its extreme and is an obvious variance of said prior art knowledge.

11. During the prosecution of the application for the patent in suit, the Patent Office held that the providing of threads throughout the length of a drill rod did not constitute an unobvious advance in the art so as to justify the grant of a patent therefor. The plaintiff acquiesced in that decision by adding other concepts to its claim in an effort to obtain the grant of a patent. The Court agrees with that decision of the Patent Office Examiner.

12. Prior to the date of invention of Ditson, et al, and more than one year prior to the date when the first application for the patent in suit was filed, it was known that threads could be formed in metal by a variety of procedures, for example: (a) various thread cutting procedures, (b) thread rolling, (c) thread grinding, and (d) thread forging. Each of these procedures was known to have advantages and disadvantages and the choice of which to use was made on the basis of the advan-

tages and disadvantages of the various procedures as applied to the particular thread forming application under consideration. It was known that thread rolling had the advantages that it was comparatively inexpensive when a substantial number of pieces were to be formed, and that the resulting threads were comparatively strong. There was some delay in the adoption of thread rolling process for workpieces of relatively large diameter caused by a delay in the manufacture of thread rolling machines of sufficient strength and power to perform the thread rolling operation on such larger workpieces. The sellers of thread rolling equipment were regularly soliciting those manufacturers who were producing threads in workpieces seeking to sell thread rolling equipment to those manufacturers. All of this would have been known to a person involved in a manufacturing process requiring the forming of threads.

13. Prior to the date of invention of Ditson, et al, and more than one year prior to the date when the first application for the patent in suit was filed, it was known that when metals such as that employed in drill rods was rolled to form threads therein a seam would be formed at the crest of the thread. The recommended practice of those familiar with thread rolling was that the seam be open. Such an open seam if of certain dimensions corresponds to what the patent in suit refers to as a "groove". Thus, if one were to follow this prior art knowledge and form threads on drill rods by a thread rolling process, one would necessarily produce a thread having a groove seam or crevice at the crest of the thread which would extend the full length of the thread in one form or another.

14. Prior to the date of invention of Ditson, et al, and more than one year prior to the date on the first application for the patent in suit was filed, it would have been obvious to one skilled in the art to form threads on drill rods by th thread rolling process and, if following the known recommended procedures, the stock were of such size as to keep the seam of the crest open, the resulting thread on the drill rod would have a

groove at the crest of the thread throughout the length of the thread.

15. In support of the conclusion that the forming of threads on drill rods was an obvious procedure is the fact that it had been attempted experimentally by others.

16. The Examiners in the U. S. Patent Office who handled the applications for the patent in suit held that a drill rod having threads throughout its length, *which threads were produced by rolling*, was not an unobvious advance in the art justifying the grant of a patent therefor. The applicant acquiesced in that decision by adding another limitation (i.e. the groove at the crest of the threads for the full length thereof) to the claims to the drill rod to obtain the grant of a patent. The Court agrees with that decision of the Patent Office Examiner. The Examiner was apparently not aware that this additional limitation was a necessary result of producing rolled threads by recommended techniques. In this respect, the Examiners in the Patent Office apparently did not have the best available prior art.

17. While the application for the patent in suit was pending before the United States Patent Office, the plaintiff knew that the forming of threads by roll threading would necessarily result in a seam being produced at the crest of the threads, but the plaintiff failed to advise the Patent Office of that fact. Had the Patent Office been aware of that fact, the Court feels that claims 4 and 5 of the patent in suit would not have been issued in a patent.

18. Prototypes of the drill rods set forth in claims 4 and 5 of the patent in suit were first made by employees of Landis Machine Co. in January, 1964. While comparatively short, at least some of these prototypes had all the features specified in claims 4 and 5 of the patent in suit. The production of these prototypes occurred as a result of the concept of J. D. Ditson (alone) that a drill rod be produced which had threads through-

out its length, which threads would be roll formed. At this time Mr. Ditson knew that a seam would be produced in the threads; but, he did not request Landis to incorporate a seam (either open or closed) and did not regard such a seam as a desirable characteristic. As illustrative of what he wanted, he supplied Landis Machine Co. with one of plaintiff's standard production drawings illustrating the thread which plaintiff was then cutting on the ends of drill rods. For the next several months after the production of the prototypes he considered the possibility of eliminating the seam. Ultimately, the plaintiff decided that the seam was not deleterious and it was decided to leave it on the rods. At the time of rolling the prototypes, the employees of Landis Machine Co. experimented with workpieces of diverse diameters in order to reach a correct size to produce a thread of the dimensions required by the plaintiff; as a result, the seams on the prototype rods varied in width and at least some had seams which corresponded to the term "groove" as used in the patent in suit, and thereby had all of the characteristics specified by claims 4 and 5 of the patent in suit. Such experimentation as to workpiece size was a standard practice of the Landis Machine Co. in investigating an application of the roll threading technique to the requirements of a new customer.

19. Subsequent to the production of said prototype rods, James F. Cantrel suggested that the groove might be used for "lubrication" purposes. This was deemed by the plaintiff to be a novel concept and a disclosure thereof was included in the specifications of the applications for the patent in suit. James F. Cantrel was added to the applications as a co-inventor solely because of this suggestion. His suggestion was not made until after the prototype rods were produced, which prototype rods had all of the features specified in claims 4 and 5 of the patent in suit. James F. Cantrel had nothing to do with respect to the production of those prototype rods. In no way did James F. Cantrel contribute to the origination or development of the subject matter of claims 4 and 5 of the patent in suit.

20. Prior to the date of invention of Ditson, et al, and more than one year prior to the first date when the application for the patent in suit was filed, it was known to lubricate the threaded joints of items of the nature of drill rods by providing depressions in the threads which depressions had lubricant therein. This is exemplified by prior art Italian Patent No. 513,952, issued February 8, 1955. As a result of this prior art, it would have been obvious to one skilled in the art that a lubricant depression could be located on the thread at the crest or elsewhere as desired, and it would have been obvious that a depression (such as the open seam produced by thread rolling) was present it could be used for lubricant purposes.

21. Prior to the date of invention of Ditson, et al, and more than one year prior to the first date when the application for the patent in suit was filed, the subject matter of claims 4 and 5 of the patent in suit would, as a whole, have been obvious to one of ordinary skill in the art.

22. In designing the manufacturing operation to roll form threads on an item such as drill rods, the prudent procedure is to attempt to form a groove throughout the length of the threads. The reason for this is that it thereby serves as a "safety valve" if too much metal is present during the thread rolling process (for example because of a particular workpiece being slightly oversize), that extra metal has some place to go by filling up part or all of the open seam. Were there a closed seam and then too much metal occurred during the rolling process, the extra metal would have no place to go and there is a likelihood of damage and excessive wear to the thread rolling equipment.

23. The defendant has stipulated that they do in fact make some rods meeting all of the specifications included in the plaintiff's patent which have an open seam throughout their length, corresponding to what is called a groove in the patent in suit. Many of the defendant's rods do not have this open

seam throughout the length of the thread; however, the quantity of each type is moot. The Court does note, however, that based upon the stipulation by the defendant, there is in fact no question about infringement if the plaintiff's patent was a valid one.

24. In its counterclaim, the defendant charged the plaintiff with "failing to exercise good faith" in its representations to the Patent Office demanding as consequences thereof that it be afforded attorneys fees. The Court finds that the conduct of the plaintiff in dealing with the Patent Office could best be described as "sales puffing". Apparently, it is the custom when prosecuting a patent application to state numerous claims in general terms and then "deal" with the examiner, obtaining as much as possible. Although the plaintiff's conduct in prosecuting this patent lacked some candor, it was apparently done in accordance with the "rules of the game."

CONCLUSIONS OF LAW

1. This Court has jurisdiction of the parties and of the causes of action set out in the Complaint and Counterclaim. The parties have waived venue.

2. By virtue of the defendant's stipulation as set forth above, the Court finds as a matter of law that if the plaintiff's patent were valid, infringement has been established.

3. The patent is presumed to be valid to the extent of the considerations involved in the decision of the Patent Office to grant the patent and the defendant has the burden of proving invalidity. In this case, the defendant has sustained this heavy burden.

4. The presumption of validity is weakened if not totally destroyed by conclusive evidence that the Examiner did not have the best prior art before him during the prosecution of the application.

5. The "invention" for which a patent was granted is determined by reference to the file wrapper or prosecution history of the application that matured into the patent, and to determine what the Patent Office Examiners considered to be novelty sufficient to justify the grant of a patent, one must look to what was finally added to prior claims to induce the Examiner to allow those claims.

6. By reason of the proceedings before the Patent Office in acquiescing in the Examiner's decision that the threading of a drill rod throughout its length did not constitute a patentable advance, the plaintiff is estopped to now contend that such is a patentable, i.e. unobvious, advance.

7. By reason of the proceedings before the Patent Office in acquiescing in the Examiner's decision that threads produced on a drill rod by roll threading did not constitute a patentable advance, the plaintiff is estopped to now contend that such is a patentable, i.e. unobvious, advance.

8. Prior to the date of invention of Ditson, et al, and more than one year prior to the date when the first application for the patent in suit was filed, the subject matter, defined by claims 4 and 5 of the patent in suit, as a whole would have been obvious to a person of ordinary skill in the art, and consequently said claims are invalid under Title 35, United States Code, Sections 102 and 103.

9. Prior to the date of invention of Ditson, et al, and more than one year prior to the date when the first application for the patent in suit was filed, it would have been obvious to a person of ordinary skill in the art to produce a drill rod having threads throughout its length, which threads were produced by rolling, with such threads having a groove at the crest of the threads throughout the length of the threads.

10. An individual cannot remove from the public domain the right to use a known process of manufacture as applied to a known product even though others have not previously made

that specific product by that specific process; and a patent, the effect of which is to do so, is invalid. A clever use is not patentable merely because others have failed to apply known art for a particular purpose.

11. Evidence of commercial success is not a substitute for the existence of patentable invention and will not save a patent to subject matter that is obvious.

12. Claims 4 and 5 of the patent in suit do not specify that the "lubrication" concept is a feature of the rods, and it would be improper to read such a limitation into these claims.

13. The use of a groove at the crest of the threads of a drill rod for lubrication purposes would have been obvious to one skilled in the art as of the date of invention of J. D. Ditson, et al, and more than one year prior to the date when the first application for the patent in suit was filed.

14. There is nothing legally reprehensible about the act of copying a competitor's product which is not protected by a valid patent; in fact, it is in the public interest that such competition be developed.

15. The patent referred to under number 3,424,479 is hereby declared invalid.

16. The plaintiff shall take nothing on his complaint and the defendant shall be awarded its costs.

17. The defendant has failed to sustain its burden of proof on the counterclaim and shall take nothing thereby plaintiff to be awarded its costs.

18. Final Judgment to be entered in accordance with these Findings of Fact and Conclusions of Law.

DONE AND ORDERED at Miami, Florida this 23rd day of February, 1972.

PETER T. FAY
United States District Judge

UNITED STATES COURT OF APPEALS
For the Fifth Circuit
October Term, 1972

No. 72-2026

D. C. Docket No. Civ. 71-1074-PF

INGERSOLL-RAND COMPANY,
Plaintiff-Appellant-Cross Appellee,

versus

BRUNNER & LAY, INC.,
Defendant-Appellee-Cross Appellant.

Appeals from the United States District Court for the Southern District of Florida

Before GODBOLD, DYER and CLARK, *Circuit Judges.*

JUDGMENT

This cause came on to be heard on the transcript of the record from the United States District Court for the Southern District of Florida, and was argued by counsel;

On Consideration Whereof, It is now here ordered and adjudged by this Court that the judgment of the said District Court in this cause be, and the same is hereby, reversed; and that this cause be, and the same is hereby remanded to the said District Court for further proceedings not inconsistent with the opinion of this Court;

It is further ordered that defendant-appellee-cross appellant pay to plaintiff-appellant-cross appellee the costs on appeal to be taxed by the Clerk of this Court.

Issued as Mandate: February 20, 1973

IN THE UNITED STATES COURT OF APPEALS
For the Fifth Circuit

No. 72-2026

INGERSOLL-RAND COMPANY,
Plaintiff-Appellant-Cross Appellee,

versus

BRUNNER & LAY, INC.,
Defendant-Appellee-Cross Appellant.

Appeals from the United States District Court for the Southern District of Florida

(February 20, 1973)

Before GODBOLD, DYER and CLARK,
Circuit Judges.

CLARK. *Circuit Judge:* Invalidity for obviousness[1] is the broad subject of this patent appeal. A subsidiary issue is joined on the trial court's application of the doctrine of file wrapper estoppel. The imitator who was successful in the court below cross-appealed from the court's refusal to award it attorney's

1. 35 U. S. C. A. § 103:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

ees.[2] Because we reverse the trial court's determination of obviousness and its invocation of an estoppel against the patentees, the attorneys' fee issue is eliminated; but the case must be remanded for an accounting.

United States Letters Patent No. 3,424,479 issued to J. D. Ditson and James F. Cantrel, the assignors of the plaintiff, Ingersoll-Rand Company, on a coupling and rod system for rock drills. The present action was instituted to enjoin the defendant, Brunner & Lay, Inc., from manufacturing and marketing a drill rod which was alleged to infringe Claims 4 and 5 of the 479 patent.[3] No issue was raised as to the novelty or utility of the device covered by these patent claims.[4] Nor is infringement an issue on this appeal.[5] The complaint sought injunctive relief against continued infringement and an accounting for damages. Brunner & Lay counterclaimed for declaratory judgment of patent invalidity and sought general relief. Brunner & Lay now contends that Ingersoll-Rand's assignors were guilty of fraud in the procurement of the patent and that the trial court abused its discretion in refusing to allow Brunner & Lay to recover attorneys' fees incurred in defense of the litigation.

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2. 35 U. S. C. A. § 285.

3. Disregarding slight semantic differences, the claims are substantially identical. Claim 4 reads:

> A drill rod comprising an elongated body including a bore axially therethrough and having a single, spiral, single pitch, attachment thread which is roll formed on said body to extend circumferentially therearound continuously throughout the length of said body, the helix angle of said attachment thread being less than 15 degrees, and a single continuous groove on the crest of said attachment thread continuously throughout its length.

4. 35 U. S. C. A. §§ 101, 102.

5. Brunner & Lay stipulated that at least a portion of its production fell within all the parameters of the claims in issue. The court made no finding on the extent of this infringement because of its conclusion that the patent was invalid.

Background of the Patent

A percussion drilling rod, as described in the patent claims, is a thick steel tube usually 10 feet in length and 1½ inches in outside diameter, which forms a connection between a hammer on one end and a bit on the other end in an equipment system used to drill holes into rock formations for the purpose of setting dynamite charges. A simple analysis of the physics of the system discloses that rapid hammer blows are struck on the upper end of the drilling rod, which then drives the bit attached to its lower end into the dense material being drilled. As heavier and more efficient hammers and better bits were developed and deeper hole capacity was required, rods were strengthened and were provided with threaded sections at both ends to facilitate attachment to the hammer and bit and to enable interconnection between drill rods. Modern day drill rods not only transmit the enormous force of the rapid heavy hammer blows to the bit, but also serve to carry a stream of air down their bore and through the center of the bit to blow chips and debris back up and out of the hole.

Technology which brought improvements at the hammer and bit ends, made rod breakage due to metal fatigue and wear of threads the most acute equipment problems in this field. When drill rod breaks occurred the equipment operator either had to abandon the broken rod and bit and start a new hole with new equipment, or he had to retrieve the broken section and recondition or replace it. Rods with worn threads similarly had to be reconditioned or replaced. Prior to the marketing of present patented rod, the two principal solutions were to (1) use rods made of relatively low strength steel, which, while subject to breakage, could be reconditioned at the job site by cutting additional threads; or (2) use rods of high strength treated steel which did not break as often, but could only be reconditioned at a machine shop. Although breakage may occur at any point throughout the length of the rod, most breakage failures and wear outs occurred within the threaded areas at the ends.

The Patent in Issue

In May of 1965, J. D. Ditson applied for a patent on a oupling and drill rod system. On January 11, a continuation-n-part patent application was filed by Ditson and James F. Cantrel with the verified explanation that Cantrel had conceived nd reduced a portion of the invention to practice. This joint pplication eventuated in the grant of the 479 patent to Ditson nd Cantrel. The claims in issue here (see footnote 3 above) aught the construction of a drill rod which had a continuous oll-formed thread with a groove in its crest over the entire ength of the rod. Illustrative diagrams from the patent grant re appended to this opinion.

Pertinent to the claims involved here, the specifications of the atent provided that among the objects of the invention was provide a system which would enable the use of high strength ods that could be reconditioned in the field. Other advantages greater inherent strength and more efficient transmission of nergy were said to result from the manner in which the rod nd its accompanying coupling member would operate. Specifically, the uniformity of cross-section was described as advantageous in eliminating stress raising factors and possible auses of premature rod failure associated with points of variion in rod cross-section. The process of reconditioning a iled or broken rod was stated to be simplified because it required only the cutting off of the failed or broken portion with steel saw. This was said to enable the rod manufacturer initially employ special materials and unusual heat treatment d finishing processes in the fabrication of the rod without conderation of the field reconditioning problems that had previsly limited use of such strengthening processes and materials.

e Standard of Review

Graham v. *John Deere Co.*, 383 U.S. 1, 86 S.Ct. 684, 15 Ed.2d 545 (1966), blocks out the equation to guide our tailed fact-law analysis of the trial court's conclusion that

claims 4 and 5 of the 479 patent were erroneously allowed upon an obvious device.

> While the ultimate question of patent validity is one of law, Great A. & P. Tea Co. v. Supermarket Equipment Corp., supra, 340 U.S. at 155, 71 S.Ct. at 131, the § 103 condition, which is but one of three conditions, each of which must be satisfied, lends itself to several basic factual inquiries. Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or non-obviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy.

Here the controlling facts are undisputed. Our task is to set them into the formula standard and calculate the result.

The Prior Art

The art involved is that of metallurgy, in general, and the formation of steel rods for percussion drilling, in particular.

Early in the history of development of percussion drilling systems, practitioners used a rod constructed of twisted steel which could be sharpened on one end to serve the function of a bit. Many of such twisted rods were commonly twisted throughout the length of the rod. The nearest example is U.S. Patent No. 236,774 issued to Butler, et al in 1881. The diagrams accompanying this patent are set out in the appendix. The specifications of the Butler patent taught that the rod could be initially formed by rolling *before being twisted*. It was further provided that the spiral form would aid in freeing the hole of chips, and that the uniformity of rod contour and strength would enable the continued use of any unbroken portion either

a bit end or for insertion into the hammer without forging. her patents covering or describing twisted drill rods are British tent No. 26810 to Christiansen and U.S. Patent No. 2,733,943 Nater. However, no twisted drill rods are shown to have ght any twisting process accurate enough to permit the use the resulting twists for threading to other drill rod sections l no such twisted rods were shown to now be in use in the ticular area of percussion drilling here involved.

Drilling rods with threaded sections at each end to accom- date coupling to hammer, bit and each other were previ- ly patented. An early example is Patent No. Re. 17,557 to irston which shows end threading of a sinuous or undulatory tour, designed for use with a straight coupling so as to seat h rod end snuggly against its opposite piece. This thread coupling configuration is similar to that illustrated by Ditson Cantrel but was specified to extend only for the length of coupling or a thread width beyond. Nevertheless, both irston and the No. 1,952,996 U.S. Patent to Landgraf illus- ed threads which extended beyond the length of the coupling. lsson had also obtained U.S. Patent No. 3,211,484, which ght the utility of a rod with two separate sections of threads rrupted by an unthreaded interval of the same diameter as adjacent rod. The diagrams accompanying Karlsson are ended.

he technique of roll-forming threads on regular piping the technique of applying an external thread throughout length of a piece of such piping had also been patented Finch (U.S. No. 2,669,469) and Boyer (No. 1,904,675), ectively. Boyer's diagram is appended. His patent also phasized the advantage of easy reconditioning at remote sites he use of only a saw to square off ends of the lengths to be d together.

was known in the art of roll-forming threads that as the of the forming machine were pressed into the material which the threads were to be formed, metal was pushed

(plastically deformed) from the valley of the thread toward the peak during the process. On some materials this displaced metal was known to move from the valley toward each adjacent peak in waves, which could be left at each side of the peak to form a groove—by interrupting the rolling process, or could be pushed on to close and fold inward at the peak—thereby leaving only a barely visible or microscopic seam at the peak upon completion of rolling.

The provision for lubrication of the coupled joint by means of a groove on the thread surface had previously been patented to Rochrenwerke A.G. by Italian Patent No. S13,952. Heat treating and a finishing technique known as carburizing, which greatly strengthen steel rods, were well known to the prior art and both procedures had been widely applied to drill rod manufacture.

Expressed in terms of the claims here involved, each of the following elements or processes in drill rod manufacture had been disclosed by patents or in practice: (1) an elongated body, with (2) a full length axial bore; (3) a roll-formed helical attachment thread, with (4) a helix angle of less than 15 degrees; and (5) a groove on the thread to carry lubricant.

The Presumption of Patent Validity

One otherwise an infringer who assails the validity of a regularly issued patent bears a heavy burden of persuasion. We have variously recognized this burden to be akin to the fraud standard of clear and convincing evidence and to the criminal law standard of proof beyond a reasonable doubt, but, at a minimum, greater than a mere preponderance of the evidence. *Hobbs* v. *United States Atomic Energy Commission*, 451 F.2d 849 (5th Cir. 1971); *Stamicarbon, N.V.* v. *Escambia Chemical Corp.*, 430 F.2d 920 (5th Cir.), *cert. denied* 400 U.S. 944, 91 S.Ct. 245, 27 L.Ed.2d 248 (1970).

This presumption of patent validity is weakened and may be overcome where the evidence discloses that the examiner

did not have the best prior art before him during the prosecution of the application. *Beckman Instruments, Inc.* v. *Chemtronics, Inc.*, 439 F.2 1369 (5th Cir.), *cert. denied* 400 U.S. 956, 91 S.Ct. 354, 27 L.Ed.2d 264 (1970). However, where, as here, it is shown that the patent office considered prior art as close to the patented invention as any suggested to the court, the court should be extremely reluctant to substitute its opinion for the expertise of the patent office. *Hobbs, supra* at 863.

The Nonobviousness of the Differences

Uniquely, the drilling rod disclosed by the 479 patent was to be continuously threaded from end to end and its geometry was required to be uniform. In addition, an incomplete roll-forming process was to be used to form the continuous thread on the rod in which the thread was to be formed, so as to leave a gap or groove at its peak rather than the usual closed seam produced when this process of thread formation is carried to completion. Such combination uniformity of cross-section and unusual thread formation produced the synergistic result which must obtain when combinations of known elements are brought together in a new nonobvious combination. *Anderson's Black Rock, Inc.* v. *Pavement Salvage Co.*, 396 U.S. 57, 90 S.Ct. 305, 24 L.Ed.2d 258 (1969). *Ag Pro, Inc.* v. *Sakraida*, —— F.2d —— (5th Cir. 1973) [No. 72-1108, 2/5/73].

This novel configuration not only enabled the rod manufacturer to strengthen the rod by post-manufacturing treatment at his plant without precluding easy field reconditioning, it also increased the rod's resistance to fatigue failure by eliminating any point of change in cross-section dimension at which the unique stresses of percussion drilling could concentrate to crack and destroy the rod.

Despite the fact that most of the principal elements of the '479 rod were well known in the prior art, to combine them and add the novelty of full length threading, as did Ditson and Fantrel, required that a person ordinarily skilled in the prior art

must ignore that most rod failures occurred in the threaded sections and that the design of a rod with threads throughout its length would probably aggravate rather than lessen its tendency to fail in heavy use. Such a known disadvantage in old devices that would naturally discourage the search for a new invention in this direction, is a reliable indicator of non-obviousness. *United States* v. *Adams*, 383 U.S. 39, 86 S.Ct. 708, 15 L.Ed.2d 572 (1966).

While the art of roll-forming threads contained the knowledge that this process could be stopped at an early stage of completion and that the result would be to leave a gap or groove at the crest of the threads, it also taught that normal use of this thread-forming process called for it to be carried further to the point which left only a barely visible, or invisible seam or crevice. The trial court held that the patent examiner was *apparently* not aware that this was a necessary result of the roll-threading technique. Such an attribution of lack of expertise to patent office examiners without support in the record is error. *Hobbs* v. *United States Atomic Energy Commission*, *supra* at 863. In any event, the strengthening effect of the inventors' choice to require that the roll formation be stopped short, leaving a visible gap or groove at the thread crest for this application, was the essence of the invention here. There is no showing whatsoever that this technique of applying the roll-forming art to produce the strength desired should have been obvious to one of ordinary skill.

The district court also concluded that the threading of a drill rod for its full length merely carried the prior art concept of creating one or two sets of threads at each end of a rod to the next obvious stage. The problem for this conclusion is that no proof was adduced that this had ever been done, attempted or suggested. *Cf. Laitram Corp.* v. *Deepsouth Packing Co.*, 443 F.2d 928, 934 (5th Cir. 1971). On the other hand, the proof of frequent failure in the threaded portions of the rods clearly negates the court's unsupported conclusion.

All of the secondary considerations similarly tend to establish nonobviousness. The acceptance of the fully threaded rod was rapid and widespread. Assuming that imitation is the sincerest form of flattery converts Brunner & Lay's president to Ingersoll-Rand's best witness, for he conceded that promptly upon learning of the widespread use and acceptance of Ingersoll-Rand's rod he attempted to copy it. His first attempt at imitation was unsuccessful because he bought equipment which cut rather than rolling the thread form. However, when he finally perfected his infringement, he then reproduced Ingersoll-Rand's advertising copy almost verbatim to extol the virtues of his new product. The record is uncontradicted that commercial success was the immediate consequence of the marketing of this device. Similarly the record demonstrates that there was both a need for this type rod and a failure of others to develop it. These factors reenforce the conclusion of nonobviousness. *Hobbs* v. *United States*, *supra* at 864.

File Wrapper Estoppel

In the course of the prosecution of this patent application, the patent examiner on more than one occasion disallowed claims reading on drill rods which were roll-threaded throughout the length of the rod. Ditson and Cantrel took no appeal from this decision but rather, continued to modify their rod claims until the examiner finally allowed the present Claims 4 and 5, which provided not only for the fully roll-threaded rod but for the thread to be so formed as to have a continuous groove along its crest. The court held the plaintiff, as assignee, estopped to contend that the formation of a thread on a drill rod throughout its length, which was formed by the roll threading process, was a patentable, nonobvious advance in the art. This deduction of estoppel was erroneous.

It is, of course, well-settled that an invention is to be construed not only in light of the claims but also with reference to the file wrapper or prosecution history in the patent

office. *Graham* v. *John Deere Co. of Kansas City, supra,* 383 U.S. at 33, 86 S.Ct. at 702. An estoppel may arise from the applicant's conduct during the prosecution of his patent application. The essence of this doctrine of file wrapper estoppel is that an applicant who has limited or modified a claim in order to avoid its rejection by the patent office may not thereafter expand the claim by including subject matter thus excluded or any equivalent thereof, or by omitting limitations he has thus been caused to add. 60 Am.Jur.2d 534, *Patents* § 384.

Normally file wrapper estoppel is invoked when the holder of a valid patent claims infringement by a device which reads only upon the claim as disallowed. That is not the case here. The purpose of amendments required by the patent office is to limit and define the scope of the invention in the light of the prior art cited by the patent office against it. When the amendatory language is accepted by the patent office and a patent is issued thereon, the language of the specification and claims, as thus modified, approved by the patent office, defines the invention and constitutes the grant. *Williams Bit and Tool Co.* v. *Christensen Diamond Products Co.,* 399 F.2d 628 (5th Cir. 1968).

In sum, a patentee who is estopped from attempting to enlarge the scope of his monopoly by asserting infringement by a competitor's product which is only covered by the rejected patent claim, is not precluded from contending that the patent claim before amendment was erroneously rejected by the patent office *for the purpose of showing that his patent as issued is nonobvious.* The action of a patent applicant in voluntarily narrowing his claim to conform to the opinion of the patent examiner furnishes no basis in fact or reason for inferring that he has admitted the invalidity of the patent as issued, in whole or in part. *International Cellucotton Products Co.* v. *Stenilek Co.,* 94 F.2d 10 (2nd Cir. 1938).

Invention by Cantrel

The finding by the district court that Cantrel contributed nothing to the device described in Claims 4 and 5 is clearly erroneous. Not only does the presumption of patent validity carry the initial burden of establishing his standing as a co-inventor, but also an examination of the file wrapper and the deposition and testimonial evidence discloses his participation in the creation of the patented device. No contrary evidence appears in the record.

Conclusion

The judgment of the district court is reversed and the cause is remanded for further proceedings not inconsistent with this opinion.

REVERSED and REMANDED.

16 INGERSOLL-RAND CO. v. BRUNNER & LAY, INC.

THE PATENT IN ISSUE

Jan. 28, 1969 J. D. DITSON ETAL 3,424,479

COUPLING AND ROD SYSTEM FOR ROCK DRILLS

Filed Jan. 11, 1966 Sheet 1 of 2

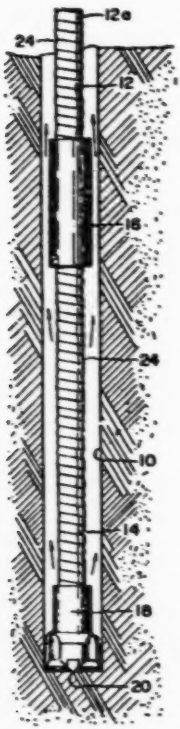


FIG. 1

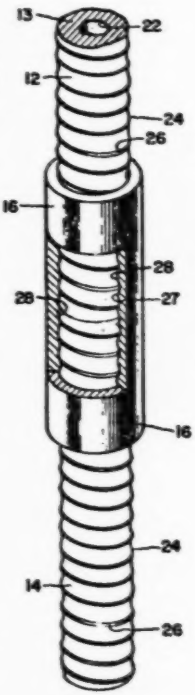


FIG. 2

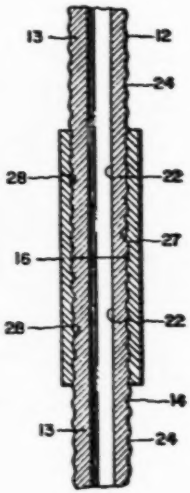


FIG. 3

KEY	
10.	Hole
13.	Drill rod body
16.	Coupling
18.	Bit
24.	Continuous thread
26.	Groove on thread crest

INVENTORS
J.D. DITSON
JAMES F. CANTREL

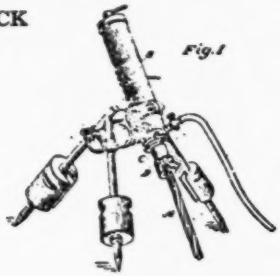
INGERSOLL-RAND CO. v. BRUNNER & LAY, INC. 17

PRIOR ART PATENTS

A. L. BUTLER & M. C. BULLOCK
Striking Drill for
Mining Purposes.

No. 236,774

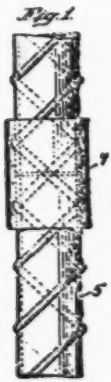
Patented Jan. 18, 1881



E. S. BOYER
Pipe

No. 1,904,675
April 18, 1933

Filed April 13, 1931



B.H.A. KARLSSON ET AL
Extension Rod for
Drill Rods

No. 3,211,484
Oct. 12, 1965

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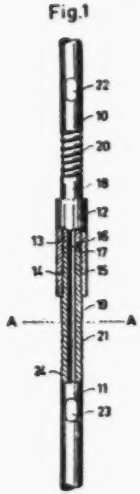

Adm. Office, U.S. Courts—Scofields' Quality Printers, Inc., N. O., La.

IN THE UNITED STATES COURT OF APPEALS

For the Fifth Circuit

No. 72-2026

INGERSOLL-RAND COMPANY,
Plaintiff-Appellant-Cross Appellee,

versus

BRUNNER & LAY, INC.,
Defendant-Appellee-Cross Appellant.

Appeals from the United States District Court for the Southern District of Florida

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N PETITION FOR REHEARING AND PETITION FOR REHEARING EN BANC

(Opinion Feb. 20, 1973, 5 Cir., 1973, ... F. 2d .....).

(April 4, 1973)

Before GODBOLD, DYER and CLARK,
Circuit Judges.

Per Curiam: The Petition for Rehearing is DENIED and o member of this panel nor Judge in regular active service n the Court having requested that the Court be polled on ehearing en banc, (Rule 35 Federal Rules of Appellate Pro-edure; Local Fifth Circuit Rule 12) the Petition for Rehearing n Banc is DENIED.

AUGMENTED STATEMENT OF THE CASE

In drilling blast holes, etc., in rock a bit is employed at the bottom of the hole to chip away at the rock in response to repeated hammer blows applied to the bit. The hammer is power driven and positioned above ground. It is connected to the bit by "drill rods" or "drill steel" which transmit the hammer blows from the above-ground hammer to the bit. As the hole becomes deeper additional lengths of drill rods are coupled together to extend the required distance. The attachment of one drill rod to the next is made by means of an internally threaded coupling which screws onto threads on the ends of the drill rod. The thread illustrated in the patent (other than the existence of the "groove" thereon) is conventional for drill rods, having been developed by third parties some years previously. Drill rods are subject to wear (particularly due to the abrasive conditions involved) and in time will break due to fatigue.

From the very beginning rods would break in use and, if a substantial length of the rod remained, it was common to rethread the broken end of the rod so as to make the rod reuseable. Prior to the patent in suit the art recognized that this rethreading operation could be avoided if: (1) the rod was threaded throughout its length or (2) the rod was provided with additional lengths of threads at each end (but not necessarily thread throughout its length so that when the end threads wore or became broken the end thread could be cut off with the remainder of the rod then being reuseable. The advent of carburized rods made such procedures more important because a rethreading of a carburized rod was more easily performed in a shop established to do the work than it was in the field.

The forming of threads is an ancient art and it has long been known that there are various procedures for doing so, e.g.

tting, roll threading, forging, etc. While roll threading is one the earliest procedures for the forming of threads, its use came much more extensive during World War II and thereter. It was known to be an inexpensive way of producing reads, one reason being that metal is not removed and disrded, but rather pushed from the valleys to form the crests the threads (thus apparently enlarging the size of the rod). anufacturers of roll threading machines had long sought to terest drill rod manufacturers in roll threading drill rods. pon several occasions efforts were made to roll thread drill ds, but these efforts did not work out (at least in part due the inadequate capacity of the roll threading machines to ndle the thick rods here involved, e.g. one and one-half ches in diameter).

As is well known in the threading art, when, during the ocess of roll threading, metal is displaced from the areas which the valleys of the threads are to be located and flows twardly at each side to form the crests of the threads, this owing metal approaches the crest of the thread from each side nd at that crest forms a "seam"; that is, a line of demarcation which the metal from the opposite sides is not bonded toether. In the initial stages of the roll threading operation this am is quite wide and as the roll threading progresses, the seam comes progressively narrower. If the roll threading process continued, the metal from each side abuts the metal at the her side forming a closed seam as distinguished from an open am when the sides do not abut. It can even be carried out ntil the metal from one side folds over the top of the metal of e other side completely concealing the seam, although the am is still there extending downwardly from below the upper rface of the metal of the thread. The prior art recommended ractice of the roll threading industry was to discontinue the ll threading operation when the seam is still open, a condition hich the patent refers to as a "groove" at the crest of the reads. This recommendation was based on the knowledge

that to roll a closed seam required an "over stuffing" of the rolling dies which reduced their useful life and increased the danger of breaking a die.*

The origin of the invention of the patent in suit occurred when employees of Ingersoll-Rand approached a manufacturer of roll threading machines (Landis Machine) and asked if their machines could produce threads on drill rods throughout the length of the rods. Landis Machine produced the necessary roll threading dies (at the expense of Ingersoll-Rand) and roll threaded some short lengths of drill rods supplied by Ingersoll-Rand to Landis' specifications. All of these rods necessarily had seams at the crests of the threads with the seam at the crest of some of the rods being open (*i.e.* Landis was following its conventional practice of seeking to produce open seams on the rods in order to protect the threading equipment). Ingersoll-Rand did not initially request that open seams be produced and even suggested an alternative procedure to endeavor to elim-

* A prior art publication put it thus:

"TROUBLE SOURCE THREE

"Rolled thread crests should have a crater—an area at the peak of the thread where metal flowing up from either side does not quite meet. This feature is visible to the naked eye on larger workpieces with coarse pitch threads, but magnification is necessary for inspecting craters on fine pitch threads (see Figure 1).

"Rolled crests indicate either an oversize blank or roll axes too close to each other or both. This condition deprives the rolls of the pressure relieving area necessary for maximum die roll economy. *It is recommended that the blank sizing tool be initially set to provide a maximum permissible crater,* thus providing a maximum tool wear tolerance. (See Figure 1.)" (Emphasis added.)

Figure 1

inate the seams. Ultimately it decided to accept the seams so long as they were open, *i.e.* a "groove".

The Ingersoll-Rand employees submitted a disclosure of the invention to the Ingersoll-Rand patent department. In this disclosure the novel concept presented was the threading of a drill rod throughout its length. The patent department made a patentability search. The results of that search included prior patents disclosing the concept of threading a drill rod throughout its length and the patent department reported to the inventors that this concept was unpatentable, whereupon the latter agreed. Subsequently patent applications were filed by I-R seeking patent protection on nothing more than a drill rod threaded throughout its length.

During the processing of the application by the patent office, the examiner cited prior patents showing drill rods threaded throughout their length and, based upon this, refused to issue claims to such subject matter. When Ingersoll-Rand sought to obtain claims to drill rods *roll threaded* throughout their length, the examiner held that such claims were not patentable since roll threading was merely a well known alternative process for producing threads. To support this contention the examiner made of record a patent in which threads were roll formed on a thin sheet metal tube. Unfortunately, roll threading of such a thin section is more of a crimping or bending operation, rather than the flowing of metal from one area to another such as occurs when threads are roll formed on a solid (or thick) metal bar.* Thus this patent did not reveal that in the latter instance a seam (open as a groove or closed) is necessarily produced at the crest of the threads because of the flow of metal. It was not until the ultimate phrase was added to the ends of the claims specifying that *there be a groove extending the full length of the creast of the threads* that the examiner agreed to allow the claims in question to issue as a patent

* The wall thickness of a drill rod is greater than one-quarter inch.

monopoly. Thus, the patent office's written record with respect to the application that resulted in this patent, contains no evidence showing: (1) that roll threading will result in a seam (open or closed), or (2) that the recommended prior art practice of roll threading was to form the threads with an *open* seam at the crests of the threads, thus producing a groove throughout the length of the threads.

Brunner & Lay is a relatively small manufacturer of tools for the rod drilling industry, including drill rods. When Ingersoll-Rand commenced marketing roll-threaded drill rods, Brunner & Lay investigated and concluded that it should meet this competition. It acquired a roll threading machine and commenced manufacturing and selling a roll-threaded drill rod. Based upon the recommendations of the roll threading machine manufacturer and to protect its threading equipment, Brunner & Lay stopped the roll threading process at the point at which the seam is open, i.e. what the patent refers to as a "groove". However, because of variations in material, etc., it is not uncommon for these rods to have the seam closed at some point along the length of the rod (perhaps only a very short distance). It was these latter rods that the District Court found to be non-infringing.*

The roll-threaded rods are only a relatively small part of Brunner & Lay's drill rod production. Some customers prefer them to other rods that are available, while some customers consider them to be less satisfactory than the other types of rods. When Brunner & Lay refused to pay tribute to Ingersoll-Rand on the roll-threaded rods it was making, this litigation ensued. The District Court held the patent invalid, which holding was reversed by the Court of Appeals.

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* Incidentally, I-R contends that the closing of the seam (i.e. what it calls a "crevice") renders the rod fragile, but even so it strenuously sought to have the District Court decide that these latter rods infringed the patent (i.e. embodied the allegedly "unobvious" concept). In another circuit this would render the patent invalid: *Wilcox Mfg. Co.* v. *Eastern Gas & Fuel Assoc.*, 400 F. 2d 960, 4th Cir. 1968; cert. den. 393 U. S. 1051, 21 L. Ed. 2d 693, 89 S. Ct. 691 (1969).